ARCHITECTURE IN LEBANON

The Lebanese House During the 18th and 19th Centuries

Friedrich Ragette

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Contents

„Was du ererbt von deinen Vätern hast,
Erwirb es, um es zu besitzen“

J.W. Goethe (*Faust*)

To My Wife

Foreword

THIS BOOK is about traditional architecture in Lebanon. The heart of Lebanon is in the mountains which rise between the Mediterranean Sea and the sun-drenched plains of Syria, a beautiful land of deep valleys and lofty summits which constitutes a manifold exception in the Arab Near East. For this reason a distinctive architecture developed here as the fruit of interaction between general Near Eastern concepts and the specific character of Lebanon. The Lebanese expression is strongest on the vernacular level where people respond directly to a different environment.

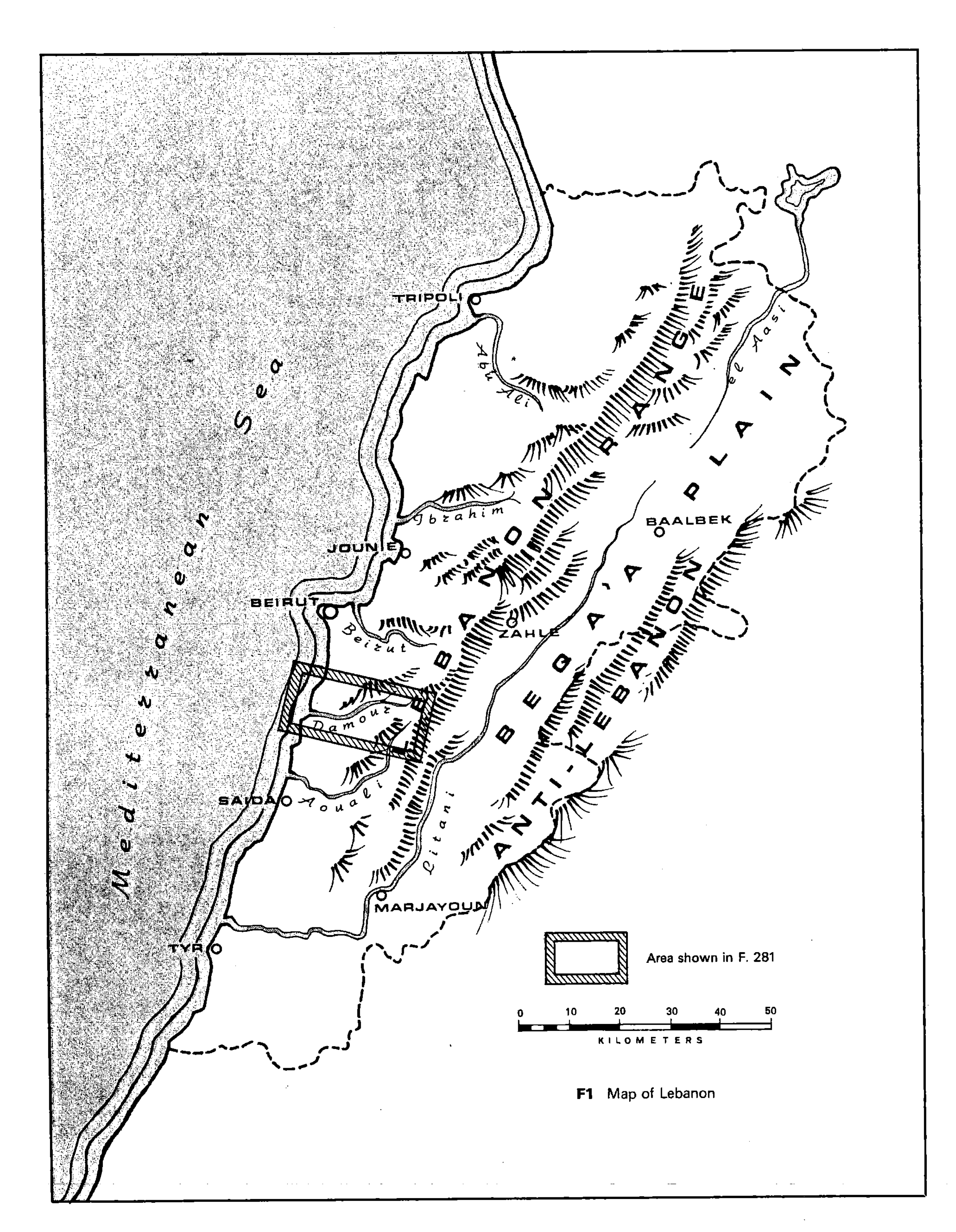
This is a study, then, of the Lebanese dwelling house as it exists in its simplest form as a shepherd's shelter, the slightly more sophisticated peasant's home, village houses, isolated residences and the relatively luxurious dwellings of the upper classes. Palaces have been excluded, however, as they constitute a special study in themselves, and to have considered them here would have meant obscuring my central concern, which is to describe the development of Lebanese domestic architecture during the eighteenth and nineteenth centuries.

The reason for limiting the scope of this study to these two centuries is that few houses exist that were built before the eighteenth century, and those which may be older have been so extensively restored that they can no longer be said to belong to any specific period. On the other hand, after 1900 or so, the Lebanese building tradition was increasingly adulterated by western influences, though it continued in a relatively pure state until World War I.

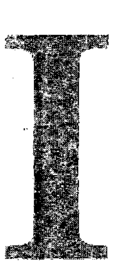
In the pages that follow I have endeavored to describe the plan, construction, exterior and interior design, and also the origin of the various morphological types of Lebanese houses. I have also discussed the architectural forms and the character of Lebanese houses in general, but as there is no clear distinction, I have not attempted to classify them as either rural or urban.

This study has developed from a course in Lebanese architecture which I have been teaching since 1964 at the American University of Beirut. It was originally written in German and presented to the Technische Hochschule of Vienna as a doctoral thesis, and I would like to take this opportunity to thank Dr. Walter Frodl, my advisor, for his counsel and guidance. I am particularly grateful to Professor Raymond S. Ghosn, Dean of the Faculty of Engineering and Architecture, the Research Committee of the Faculty of Engineering and Architecture, and to the American University of Beirut in general, whose support made this study possible.

Finally, I would like to thank all those students who helped in recording many of the most authentic products of their native land.



F1 Map of Lebanon



INFLUENCING FACTORS

1. GEOGRAPHY

THE REPUBLIC OF LEBANON is situated along the eastern Mediterranean coast at 35° latitude, with a length of about 250 km and an average width of 60 km. The chain of Mount Lebanon determines the character of the country, for its position parallel to the coast controls climate and rainfall. Altitudes which range from zero to 3000 meters allow the existence of a varied landscape. The double mountain ranges and their increased aridity to the east have discouraged traffic with the hinterland, and to this day accentuate the western orientation of the coastal dwellers. Above all, the mountains' formation, carved by numerous deep valleys cutting across the western slopes, constitute a separating element which until recently hindered a centralized administration of the country (F1).

It is not surprising, therefore, that large-scale architectural enterprises were undertaken during the rule of foreign powers, such as the Roman, and though these frequently reveal strong local characteristics, they are nonetheless of foreign origin. Independent Lebanese architecture is limited to residential constructions and to modest religious and public buildings.

2. GEOLOGY AND NATURAL BUILDING MATERIALS[1]

DURING JURASSIC TIMES, the Lebanon was covered by the sea which slowly deposited various sediments. In the Tertiary Period vigorous folds occurred, the Lebanon and Anti-Lebanon range appeared and the sea receded.

The mountains consist of many strata, usually sandstone between limestone, and are cut up by numerous clefts. In the Kesruan and El-Metn district the gray upper layer of limestone has been eroded and the multicolored sandstone is exposed. In the north we find large deposits of basalt in a previously volcanic region. Because of the presence of many valleys and gorges all geologic strata are easily accessible. This has encouraged the decorative use of varying types of stone in Lebanese buildings.

The high plain of the *Beqa'a,* lying between the Lebanon and Anti-Lebanon ranges, has alluvial characteristics. The deep soil is excellent for farming, and irrigation ensures a sufficient water supply. Because of the altitude of the plain (averaging 1000 meters), the adjacent mountains do not seem very rugged. The presence of clay and water in combination with a fairly dry climate allows the use of mud brick (adobe) construction.

The mountains of the Lebanon were originally the most densely wooded area of the Near East. The Bible extols the cedar as a symbol of strength and endurance; it is one of the saddest aspects of Lebanon that this wealth has been almost totally lost. For centuries, timber for construction has been limited to poplar, willow, walnut and maple, which

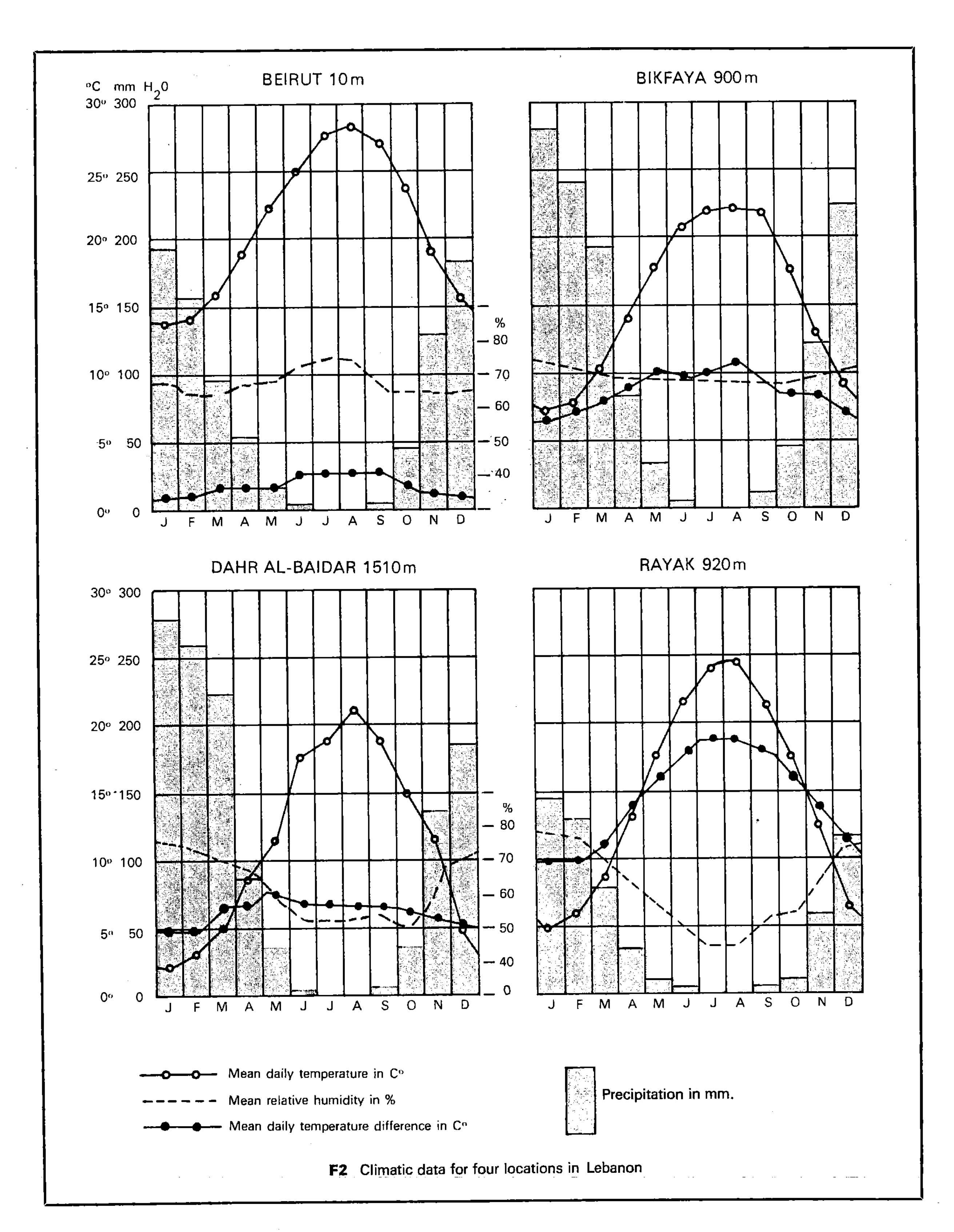
grow along the riverbanks. When mulberries were planted during the time of silk production their wood was also widely used. In some areas there are also fairly large groves of pine trees. In swampy spots we find reeds, which have always been used with mud in construction. Another material is chaff, the residue from primitive threshing methods using sleighs. Mixed with clay or mud it acts as a bonding agent which prevents the formation of cracks.

3. CLIMATE

THE YEARLY climatic cycle in Lebanon consists of rainy winters with snow down to 1000 meters, early spring with the last rainfall in May, four hot, dry summer months, and a mild autumn with little rainfall. According to the geographic structure, four climatic zones may be distinguished: coast, western slopes, high mountains and the *Beqa'a* plain. The following four figures give the climatic data for the four zones[2] (F2). Based upon this data we can characterize the climate as warm-moderate, and therefore eminently suitable for settlement.

By charting the above data on a bioclimatic diagram we can analyse the different zones. The bioclimatic diagram represents the physical comfort conditions for man,[3] which depend on the following factors:

a) AIR TEMPERATURE (ordinate): According to the seasonal disposition of the human body we distinguish between two comfort ranges, one for the winter and one for the summer. They are indicated as hatched areas.
b) RELATIVE HUMIDITY (abscissa): Next to the temperature the relative humidity is decisive for our comfort. Above 45% the upper comfort limit is reduced.
c) WIND: Air motion increases the evaporation of moisture on the skin, providing thereby a cooling effect. Cross-ventilation in buildings therefore increases the comfort range, particularly when high humidity is involved. However, air velocity must not exceed 90 m/min. in order to avoid drafts.
d) EVAPORATION: Evaporation of moisture draws thermal energy from the air and reduces its temperature. Since the air must be able to absorb the added moisture, this process is only practicable at a relative humidity of 50% or below.
e) SOLAR RADIATION: Solar radiation (kcal/m^2) can be used to heat buildings and during the sunny winter periods in Lebanon it effectively extends the lower margin of the comfort range (see right side of diagram). Above 21° C air temperature no additional solar radiation is desirable. This determines the extent of the need for shading. (Sky vault radiation is not considered in the diagram.)



F2 Climatic data for four locations in Lebanon

f) SURFACE RADIATION: If the radiation temperatures of space-enclosing surfaces are lower than the air temperature, they will increase the upper limit of the comfort range. If they are higher, the lower limits will be decreased. The temperature difference between air and surface should not be more than 1° C for colder surfaces, or 3° C for warmer surfaces. Related values are indicated on the left side of the diagram.

By superimposing the monthly mean temperature and humidity values over the comfort diagram we can judge the climatic condition of each zone:

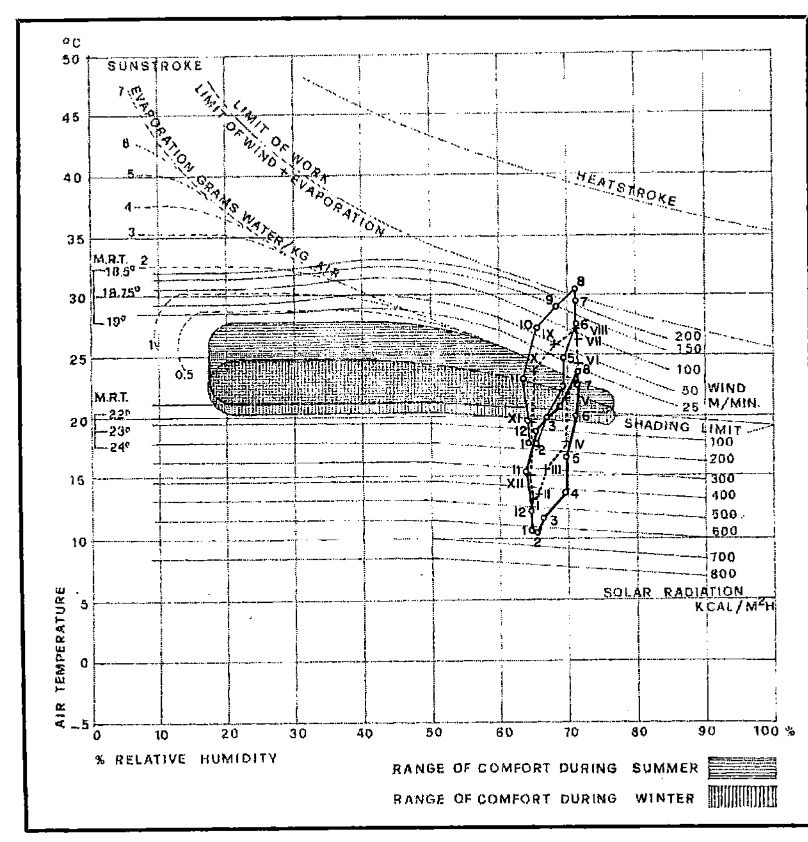
A) COASTAL ZONE, example Beirut (F3).
Daily maximum temperatures surpass the comfort limit from May onwards, and reach the work limit in August. Mean daily temperatures surpass the comfort limit from June till the end of September. Because of high humidity, cross ventilation is the only natural means of climatization. It is necessary to open buildings to the summer breeze from the southwest, to provide sun protection and sufficient thermal insulation. Heating becomes necessary in the winter during stormy periods without sunshine.

B) MEDIUM ALTITUDE ON WESTERN MOUNTAIN SLOPE, example Bikfaya (F4).
In July, daily temperatures surpass the comfort limit but never reach the work limit. Minimum temperatures always fall below the comfort limit. Insulation is therefore desired, shading is only necessary in summer. Heating is needed during the winter and the humidity requires good ventilation.

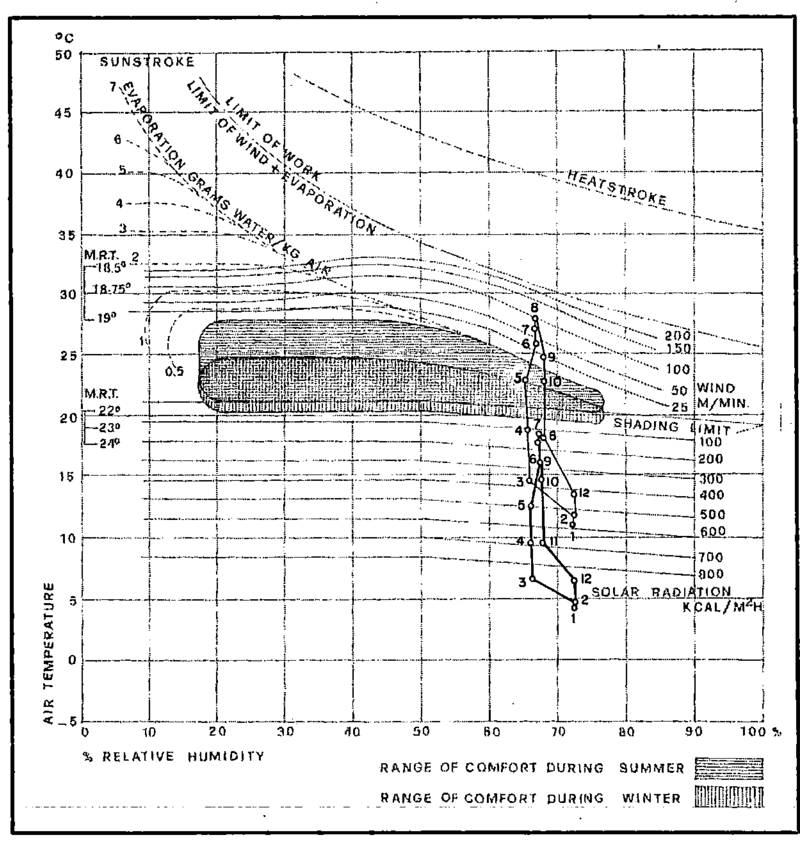
C) HIGH MOUNTAINS, example Dahr el-Baidar (F5).
Maximum temperatures reach the comfort zone only from June till September, mean temperatures always fall below the comfort limit. Insulation is needed all the year round; heating is a necessity.

D) BEQA'A PLAIN, example Rayak (F6).
This region is marked by high daily temperature differences. Mean daily temperatures reach the comfort zone only from June till September, mainly because of low night temperatures. During summer the daily maximum can be overcome by protection from the sun and thermal insulation; the low night temperatures can be compensated for by storage of thermal energy in mass construction. The low humidity does not require much ventilation, but what is needed is protection against the strong winds, which are channeled in northern or southerly directions by the nearby mountains.

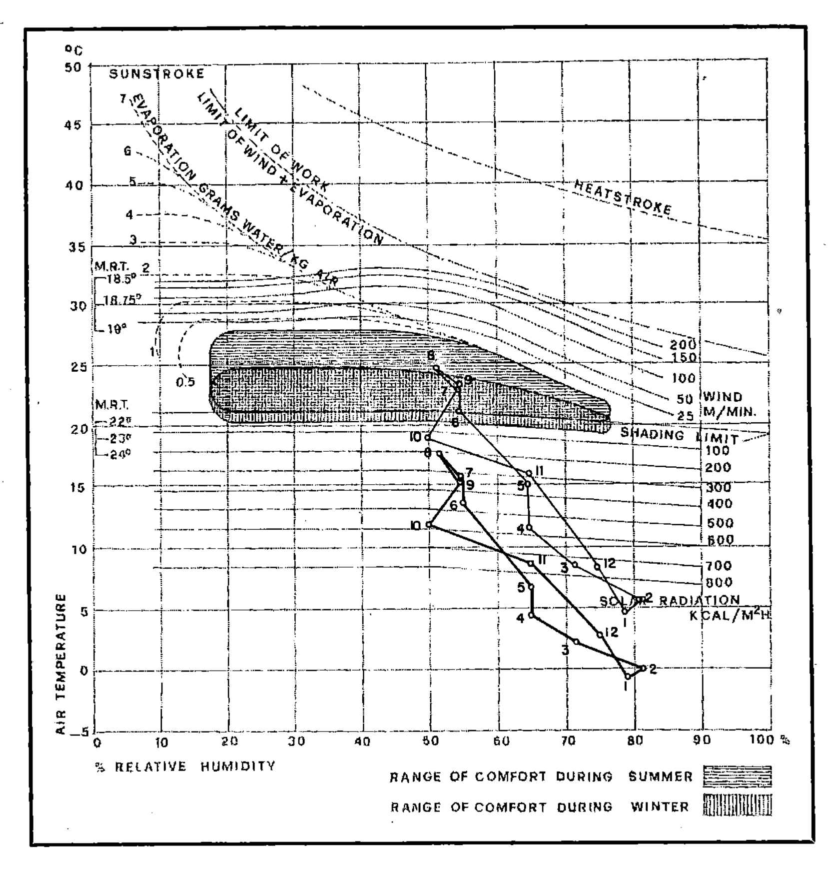
Legend:
Monthly mean temperature ranges
o——o maximum
o- - -o average
o——o minimum



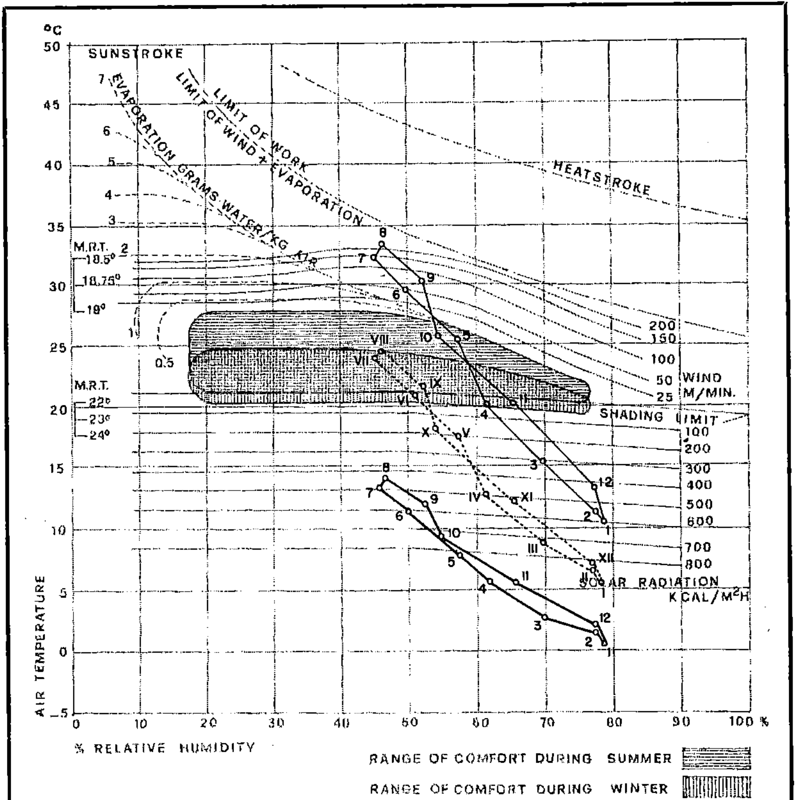
F3 Bioclimatic chart for Beirut, 10 m altitude



F4 Bioclimatic chart for Bikfaya, 900 m altitude



F5 Bioclimatic chart for Dahr el-Baidar, 1510 m altitude



F6 Bioclimatic chart for Rayak, 920 m altitude

4. HISTORY[4]

ALTHOUGH the oldest skeleton found in Lebanon is only 25,000-30,000 years old, frequent discoveries of flints indicate that Lebanon was already inhabited in the stone age—about 200,000 years ago. Shortly before the 3rd millenium the historical period begins with the invention of writing. The first historical inhabitants were the Semitic Canaanites, who also settled in neighboring Syria and Palestine.

Around 1200 B.C. the Achaeans invaded the Aegean islands and expelled the People of the Sea who fled eastward and merged with the Canaanites. The resulting people were called Phoenicians by the Greeks. Using the abundance of timber in the Lebanon, the Phoenicians became excellent shipbuilders and navigators. Operating from Byblos, Sidon, Tyre, Tripoli and Beirut, they extended the trade between Egypt and Mesopotamia to the whole Mediterranean and beyond to the Atlantic coast.

The founding of Carthage in 814 B.C. added a new Phoenician domain in the western Mediterranean and thereby strengthened the resistance of the Phoenicians against the Assyrian-Babylonian-Persian rule in Asia. Superb traders and seamen, the Phoenicians were able to retain a good measure of independence, but their defeat by Alexander the Great, when they formed the core of the Persian fleet, weakened their dominant position. During Hellenistic times trade between East and West flourished. In construction the coastal towns adopted Greek examples, but in contrast to Syria, Lebanon did not have room for new cities. Not until Roman rule did settlements begin to appear in the mountains, as indicated by numerous remains of temples and tombs. The early Christians in particular tended to settle in remote valleys, often carving their churches from the living rock.

In 551 A.D. and 555 A.D. devastating tidal waves and earthquakes destroyed the splendid coastal cities; in Beirut alone 30,000 people perished. Large parts of the towns were never rebuilt, they are still being rediscovered today.

In the 7th century the Arabs put a stop to the Christianization of the country, which had been nearly completed under Byzantine rule. While the first Omayads, Abd-al-Malik and al-Walid, were very tolerant, Abd-al-Aziz (710-20) introduced discriminating measures against Christians. The Lebanon became a refuge for the oppressed and dissatisfied. At the end of the 7th century the Maronites (after St. Maron, d. 410) established themselves as an independent sect in the upper Kadisha valley, and from there extended their influence over the north Lebanese mountains. About four hundred years later, Muslim dissidents, now known as Druzes (after Nashtakin-al- Darazi, eleventh century), settled in the southern mountains. Towards the end of the 11th century the first Crusader army reached Lebanon. In 1099 Jerusalem was conquered, and in the first quarter of the 12th century

the fortified coastal cities were taken by the Franks with the help of Italian ships. Sixty years of coexistence followed Saladin's defeat of the Crusaders at the battle of Hattin. Around 1250 the decline of the Frankish empire began. First the Mongols devastated all the cities of the coast; then the Mamlukes expelled the Crusaders for good in 1289. During Mamluke rule a balance between Christians and Muslims was reached, and the Arabization of the country was completed.

From 1516 onward the Lebanon was under Ottoman rule, and developed into a stable feudal state. Two dynasties paved the way towards security, prosperity and religious peace: the Ma'ani and the Chehabi. The Ma'ani, a Druze family, under Fakhreddin I (d. 1544) and Fakhreddin II (1590-1635) strengthened agriculture, the silk industry and trade with Florence, Venice and France. In 1608 Fakhreddin II concluded a secret pact with the Grand Duke of Tuscany against the Turks, and consequently had to seek exile in Italy from 1613-1618. After his return he again furthered economic exchange, built caravanserails, schools and bridges. This policy was continued by Emir Beshir I, of the Maronite Chehabi dynasty. Under Emir Beshir II (1788-1840) Lebanon entered into its most brilliant period.

Beginning with the 18th century, France was gaining influence in the country. Louis XIV and Louis XV took the Maronites under their special protection, and Christian students were even offered reduced boat fares to France. When Ibrahim Pasha led Egypt to war against the Ottoman Empire, the European powers entered the scene (1840). The semi-Christian Lebanon was used as a bridgehead, and Beirut began to surpass the other cities. As the result of excessive support of the Christian population, a 20-year long civil war erupted in the mountains between the Druzes and the Maronites. In 1860 France and other European powers restored peace, and in 1861 Lebanon received an internationally guaranteed autonomy within the Ottoman Empire —with the exception of the coastal cities Sidon, Beirut and Tripoli. A new constitution eliminated feudal privileges and provided equal rights for all citizens. Taxes were raised mainly for local use; governors were appointed by the Sultan and the western parties. Since this time Lebanon has been the center of western influence in the Middle East.

World War I toppled the Ottoman rule. An allied occupation followed and in 1918 Lebanon was put under a French mandate and thus came under direct French influence. Strong cultural and economic ties resulted (and concrete and steel were introduced in construction). In 1944 Lebanon gained full independence. The end of World War II and the discovery of oil in the Gulf set off a sudden economic boom, which in essence was based on the traditional role of the

country as a liberal trading center between East and West. However, the agricultural population of the mountains was now at a disadvantage, since its important function as supplier of foodstuffs was undermined by improved methods of shipping and trading. On the other hand, the mountains of the Lebanon were made accessible by a highly developed road system, and this part of the country continually gains in importance as a recreational area.

5. SOCIO-ECONOMY

We can distinguish two distinctive segments in the Lebanese population: The commercially-minded coastal dwellers and the withdrawn inhabitants of the mountains. Originally, all habitation was concentrated along the coast, the mountains being used only for lumbering. Timber was the capital upon which the Phoenician trading activity was based. Openminded, multilingual and tolerant, the Phoenicians acted as go-betweens among many cultures. This explains their greatest achievement: the formation of the alphabet which enabled them to record all existing languages with the same symbols. The Phoenicians were also great colonizers, but they never forgot their home cities. All these characteristics are retained to this day, when more than a million Lebanese abroad help to support the Lebanese economy with their trading connections and financial transactions.

Since Arab times followers of the dominating Sunnite denomination have settled in the coastal towns and plains while Shiites live in the lower hills of Southern Lebanon. Coexisting with both are large communities of Greek Orthodox Christians.

Parallel to the coastal inhabitants a tough and frugal mountain population developed through the centuries, consisting mainly of Maronites and Druzes, who elected to retain as much independence as possible by retreating into less accessible regions. The Maronites form a part of the Roman Catholic Church while the esoteric religion of the Druzes includes Muslim, Christian and Far-Eastern elements. The Druze religion prescribes monogamy and women have the same rights as men. Thus, similar living conditions shaped the attitudes of these people in identical ways: a strong sense of community coupled with mutual tolerance and love of independence. Both were agricultural people who gained their sustenance by tireless cultivation of the rugged mountain slopes.

In the 13th century Frankish rule removed the isolation of the Christians, and exposed them to western influence. The harbor cities included autonomous trading quarters for the Republic of Genoa, Venice and Pisa, and soon the Venetians gained full control of trade in the Levant. This trade was interrupted by the Mamlukes, who blocked the

harbors for fear of new invasions from the sea. In 1300 the port of Beirut was reactivated to serve as a means of communication with Damascus, and in the 15th century a Venetian colony was reestablished there.

Commenting on feudalism in Lebanon during the 13th and 14th centuries Philip Hitti describes the living conditions of the period: "Lebanese tenants, unlike their counterparts in Syria and Egypt, were not serfs. They maintained their freedom of change of location and choice of the holder they would serve. Even in the Latin system introduced into the country no such freedom was enjoyed by the tenants. Lebanese fiefs were usually small, one to ten villages, parcelled out among the members of the aristocratic families. The tenant's share was a fixed part of the produce and varied from three-quarters to two-thirds, except in irrigated lands where it averaged one half."[5]

The discovery of the sea route to India (1488) lessened the commercial importance of the Levant. The beginning of Ottoman rule (1516) also reduced its strategic value. In 1521 the Venetians concluded the first trade agreement with Sulayman the Magnificent. Trade now consisted increasingly of local products, particularly silk, which stimulated the development of the country. The Sultan contented himself with the collection of taxes, and left a large measure of independence to the inaccessible mountain areas.

In 1784 the French traveller Volney commented on the individual freedom and special privileges enjoyed by the Lebanese living in the mountain regions, stating that "here, unlike any other Turkish country, everyone enjoys full security for his property and life." He pointed out that the Lebanese peasant was no richer than peasants elsewhere but lived in tranquility, not fearing that the military officer, the district governor or the pasha would send his soldiers to oppress him.[6]

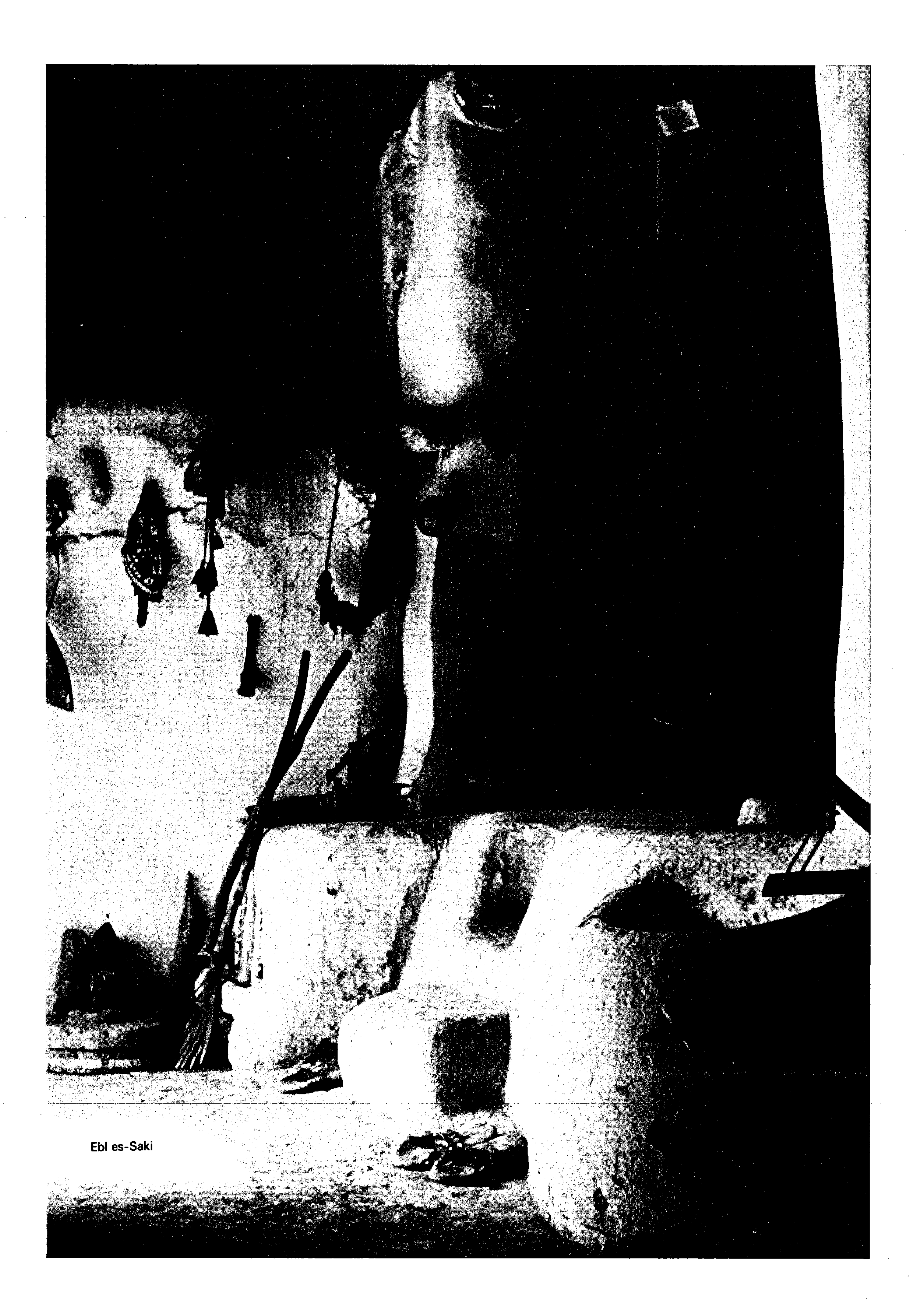
Conditions in the occupied coastal zone, however, were less favorable. In 1775 Beirut counted only 6,000 inhabitants and in 1848 not more than 15,000.[7] After 1860, however, the rural exodus, which has been mainly responsible for Beirut's spectacular growth began. The massacres of 1860 in Mount Lebanon, the collapse of the silk industry under the impact of European industrial fibres and the decline in local handicrafts due to European industrial competition brought about a lasting flow of emigrants. The emigrants remained attached to their home communities, kept sending money in support of their relatives and often returned later to pass their retirement days in their native country. This is due to the fact that the family holds the central position in the extensive framework of communal attachments and traditional loyalties of Lebanese society.

Great class differences were unknown and John Gulick writes in his study of the village of Al-Munsif north of Byblos: "...the social structure is equalitarian. Though individuals are rated on a scale of values from excellent to worthless, such judgements do not seem to be applied to groups of people. . . . Families are to some extent distinguished from each other in terms of prosperity, but this seems to apply only to conjugal, or at most, to extended families. Numerous examples were given of families now well off which a few years ago had been poor, and vice versa. Notable prosperity or poverty both seem to be regarded as transitory situations mostly due to 'luck'."[8]

It is only in recent times that the sudden mobility within the country, the rapid development of the main cities and the acceptance of and even addiction to all western novelties, have brought about profound changes which jeopardize the survival of traditional values.

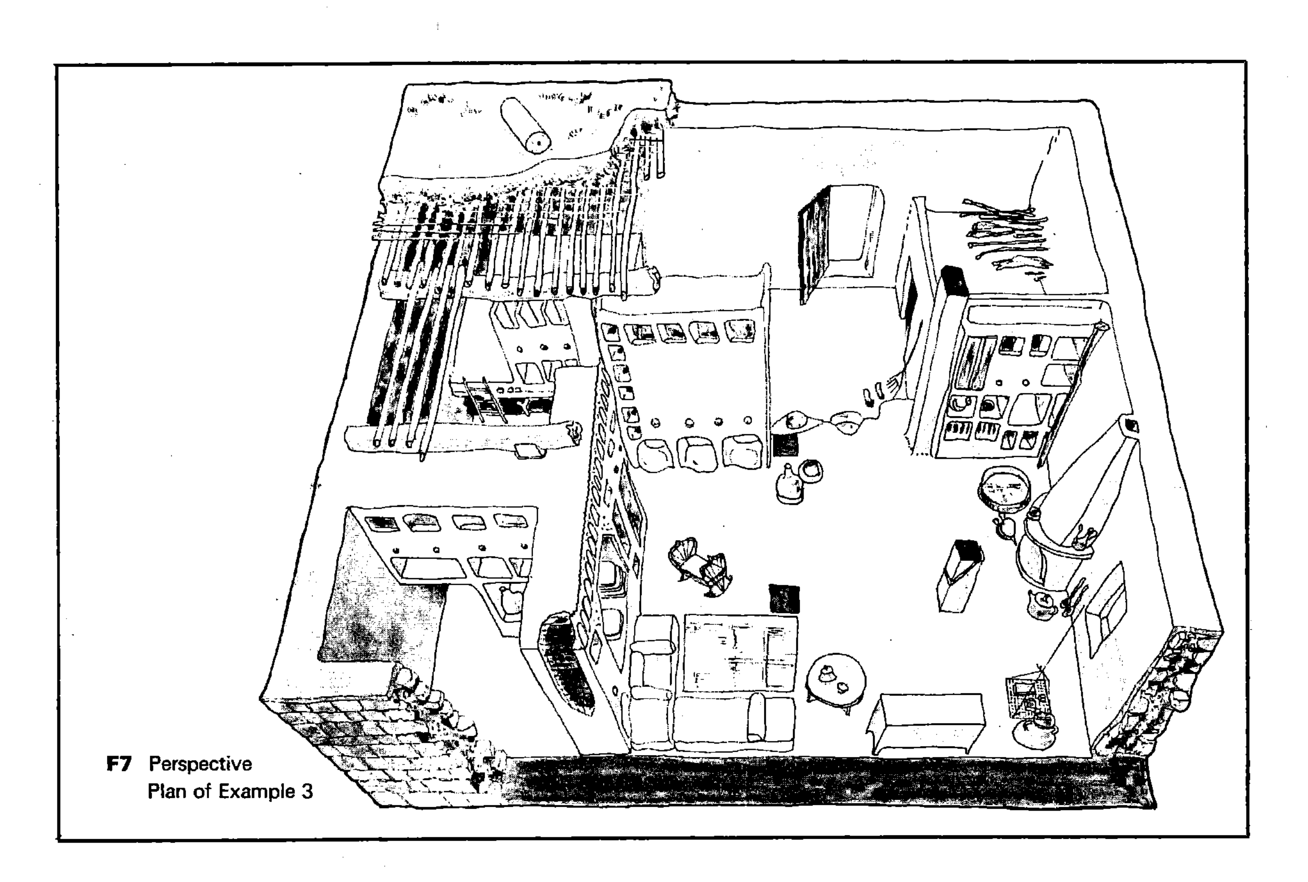
II

TYPES OF HOUSES



Ebl es-Saki

1. The Closed Rectangular House

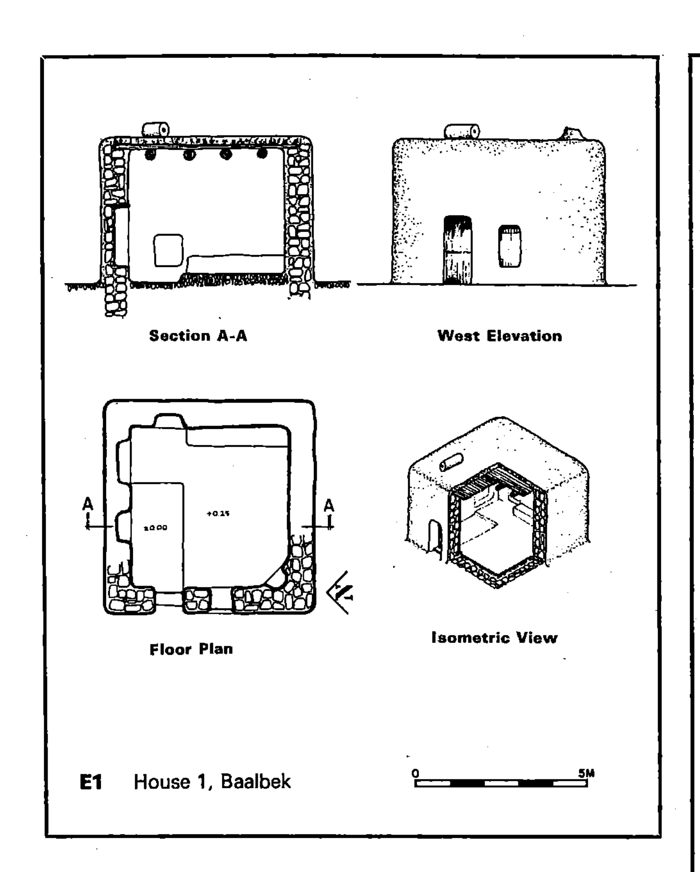


F7 Perspective Plan of Example 3

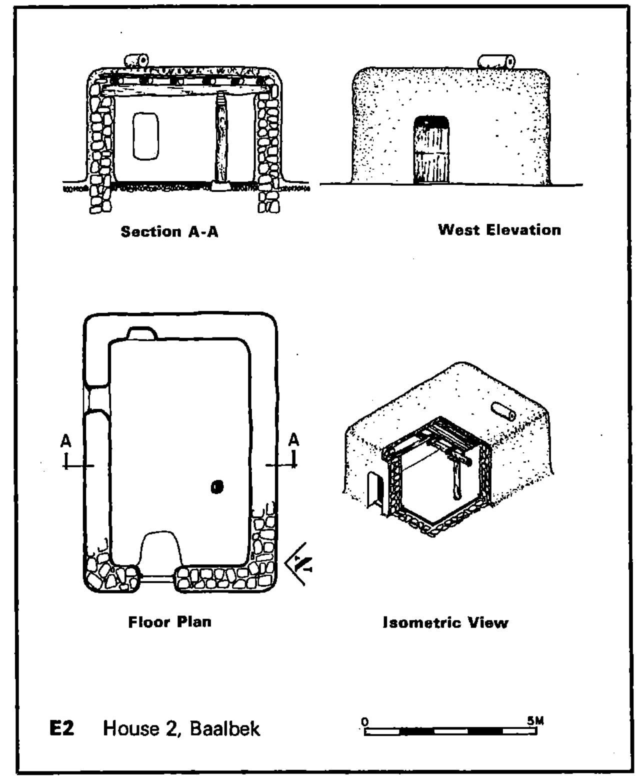
A. PLAN

THE SIMPLEST TYPE of flat-roofed house consists of a single square or rectangular space (*bayt*)[9] with a low door (*bāb*), ventilation openings below the roof (*ṭāqāt*) and one or two small windows (*shubbāk*). If there are no other openings to the outside we call such a rectangular house closed. The largest dimension of a space without interior supports is limited by the common timber length to about 4.5 m.; a square room will then contain 20 m². This is sufficient to shelter four persons (E1). The floor has two levels, the area next to the entrance and its high stone threshold (*bertāsh*) is even with the ground and is used as soiled service space (*madura*). Shoes and tools are deposited here. The remaining area is raised by 20 to 75 cm. to form a clean platform (*maṣṭabeh*) for living and sleeping. The exterior walls, which are 50 to 100 cm. thick, include niches for storage.

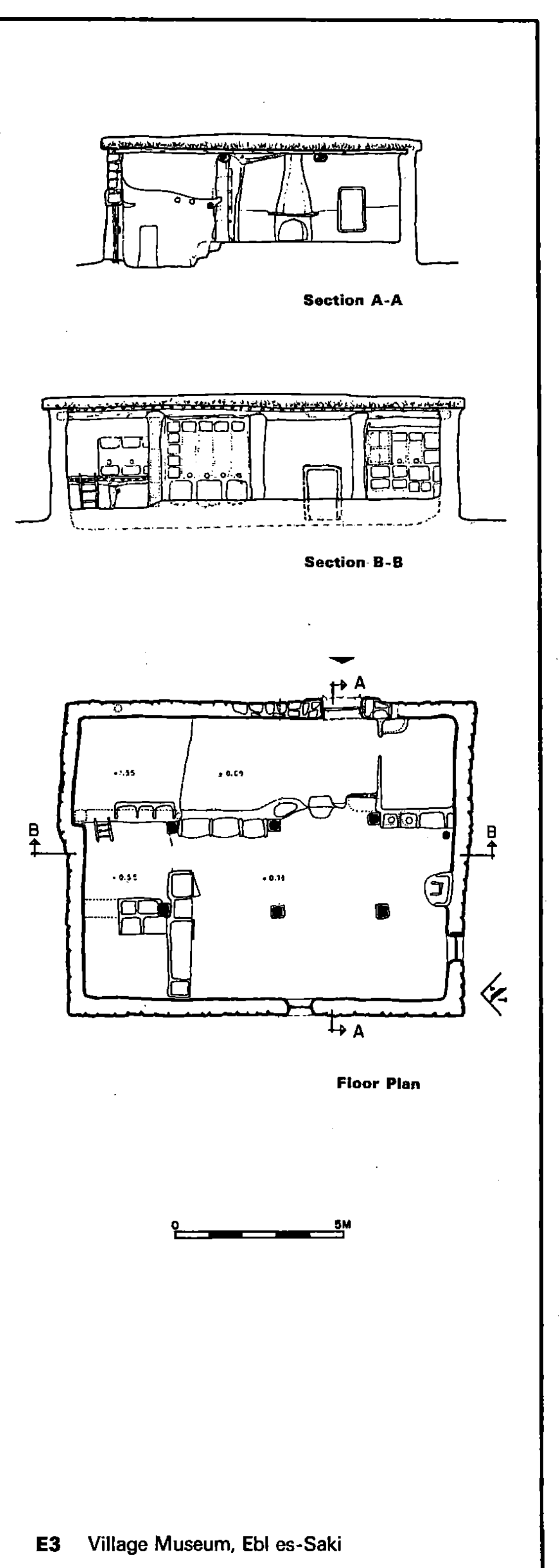
Example E2 shows the enlargement of the space to 26 m² by means of one interior support. The logical extension of this principle produces large spaces with an internal system of pillars and enclosed by bearing walls. The pillars subdivide the space into square or rectangular units which are called bays (*'aynāt*, pl. of *'ayn*). A fine example of such a house is E3; it has six pillars and measures 88 m². One third of the area serves as a stable (*'iṣṭabl*) and fodder storage (*matban*); two thirds are raised by 75 cm. and serve as family room



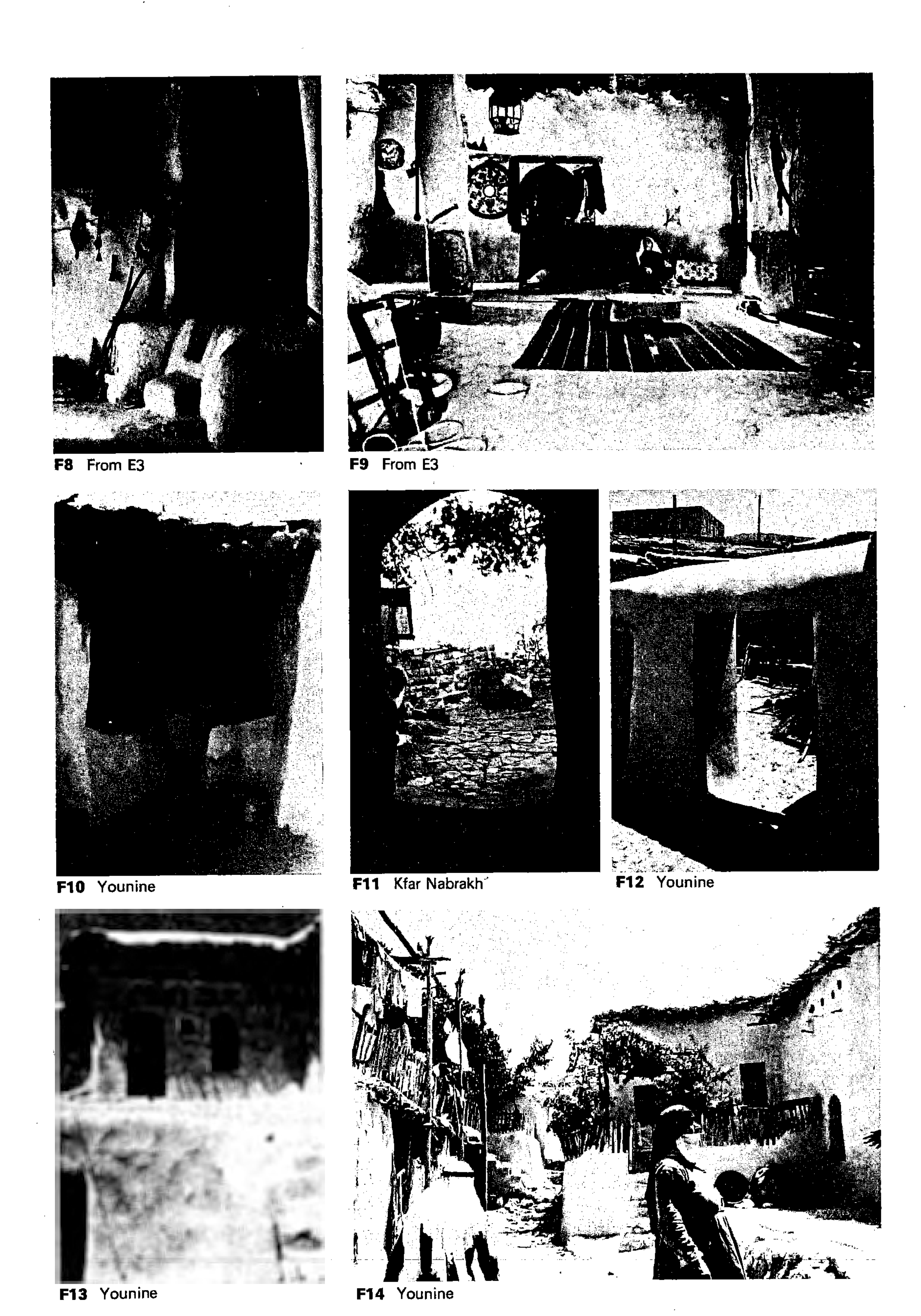
E1 House 1, Baalbek



E2 House 2, Baalbek



E3 Village Museum, Ebl es-Saki



F8 From E3

F9 From E3

F10 Younine

F11 Kfar Nabrakh

F12 Younine

F13 Younine

F14 Younine

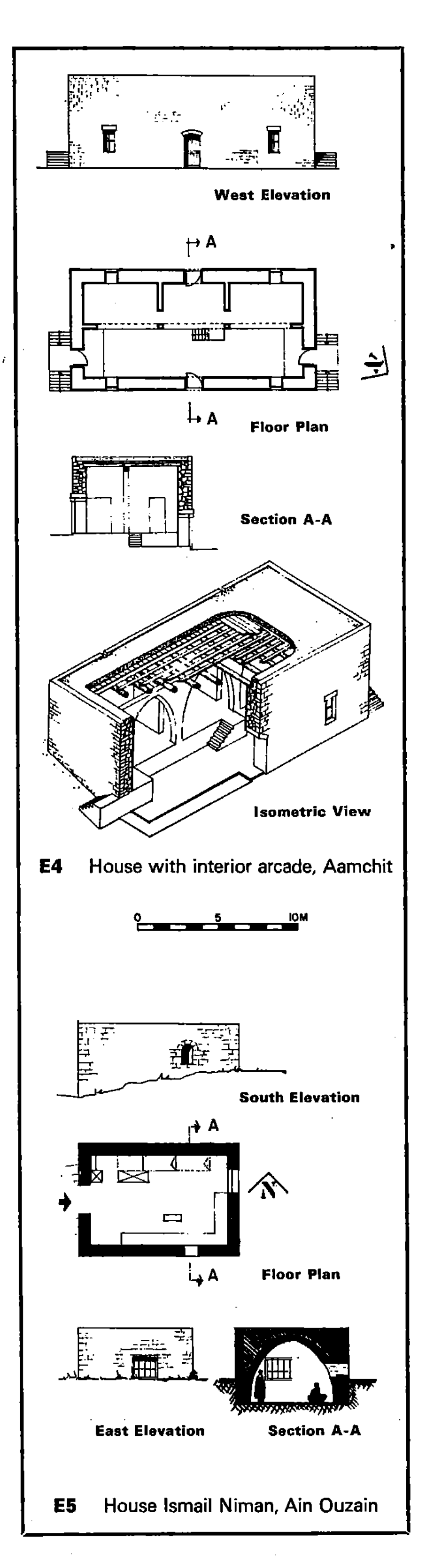
(*maskan*) and storage (*ḥāṣel*). The grouping of all living and working functions under one roof and into one space without full divisions satisfied the need for security and allowed the use of animal warmth during the winter. It also imposed a very close contact between man and animal.

Elsewhere I have described in detail example E3,[10] but a summary may be appropriate here (F7). Left of the entrance we have space for the storage of tools with a place for firewood above. To the right is the stable with adjacent fodder storage. The living area is three steps above (F8). From the stable this space is separated by silos (*kuwwārāt*), and from the store by a wardrobe unit (*yūk*). The area near the fireplace serves as kitchen, or for sitting or sleeping (F9). When we look at the plans of E1 to E3 we must take into consideration the importance of the open service space in front of the house. During the day the actual working and living space is outside. Usually on the shady northside a small open construction serves as kitchen (*daykūneh*). Most of the cooking is done on a stove (*mawkadeh*), the baking of bread in an earthen oven (*tannūr*) (F10). Outside we find the water reservoir (*bīr*), a well (*nab'*) or at least a basin which receives the water brought from the village fountain. In a remote corner we may have the manure deposit and an oriental toilet (*mirḥāḍ*). Manure used to be dried in the shape of cakes to be used as fuel. The surface directly in front of the door is usually paved and shaded by a tree or vines (F11). Often several houses belonging to a clan are grouped around a common courtyard (*hosh*) with a single entrance. In the past whole quarters of a town were similarly organized and closed during the night[11] (F12, F13, F14).

Example E4 reveals the change from mud and rubble to cut stone construction, which brings with it an increased rigidity of form. This is expressed in plan by sharp rectangular corners and strict separation of spaces. The previously soft transition of the internal levels turns into an abrupt step. The arcade (*habl knāṭer* "line of arches") introduces a strong division of the interior space into aisles (*swā'*, pl. of *sū'*). The organic unity of the interior space is reduced, although the arcade introduces a formal enrichment.

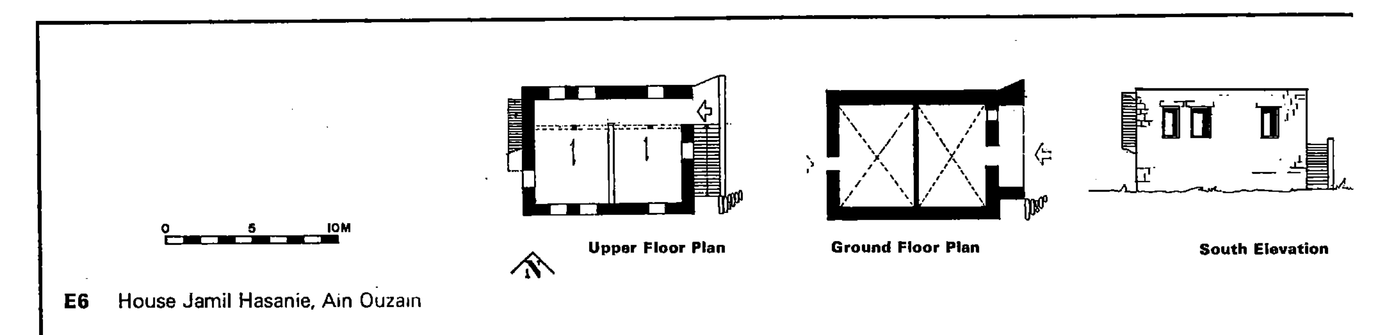
Example E5 turns to vaulted construction. The single-cell building of 5 by 8 m. is similar to E1. The one-directional barrel vault results in a tunnel effect which is not really suitable for living quarters; it is therefore used predominantly for service spaces. The cross-vault creates a more satisfactory space. At the same time the use of massive vaulting invites the addition of an upper floor.

Example E6 shows the effect of this development. The adoption of two-floor construction is very significant since it allows the vertical separation of living- and service-areas. It terminates the cohabitation of man and animal, thus sym-

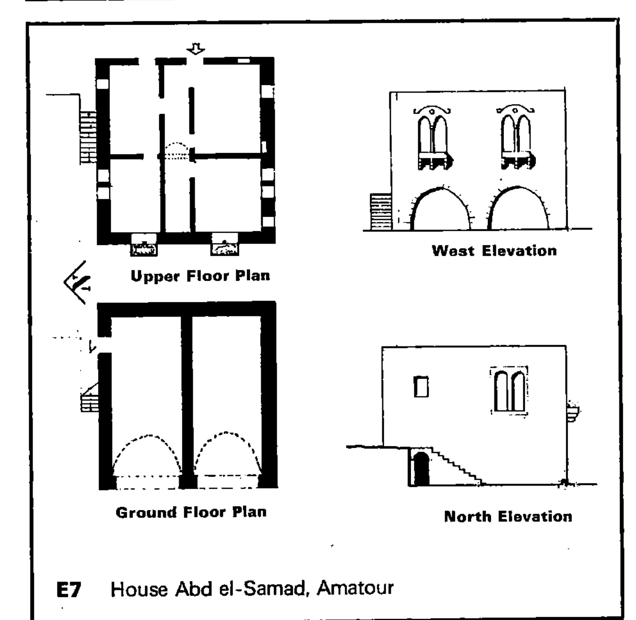


E4 House with interior arcade, Aamchit

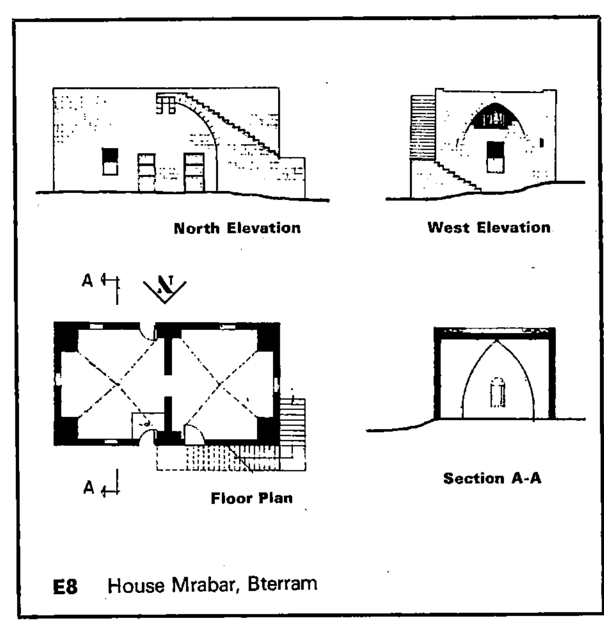
E5 House Ismail Niman, Ain Ouzain



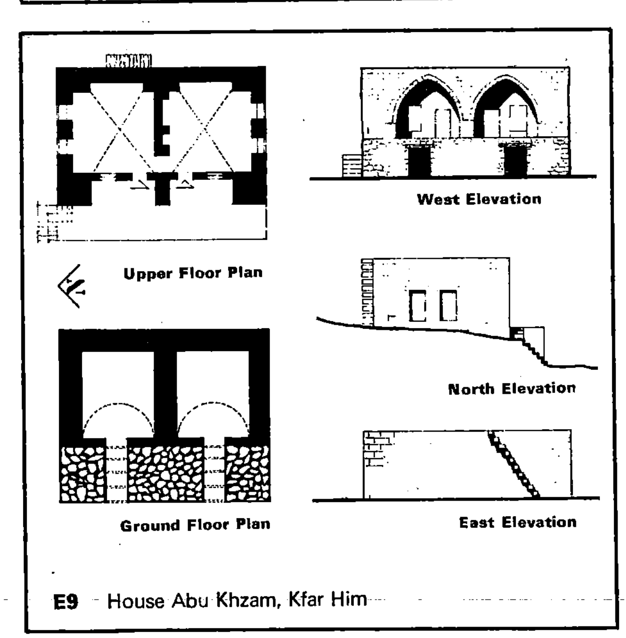
E6 House Jamil Hasanie, Ain Ouzain



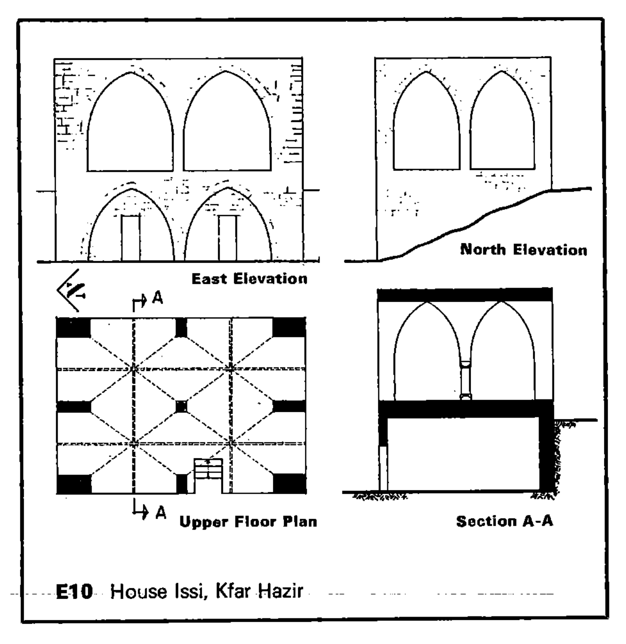
E7 House Abd el-Samad, Amatour



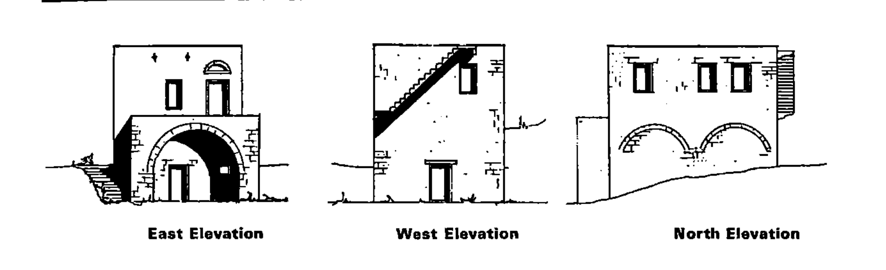
E8 House Mrabar, Bterram



E9 House Abu Khzam, Kfar Him



E10 House Issi, Kfar Hazir



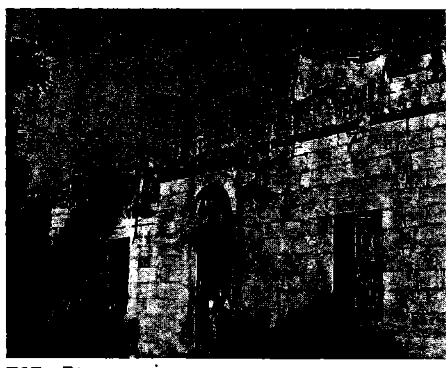
bolizing man's emancipation from unremitting toil. The connection between floors is always external. E 6 has a flat-roofed upper floor with an interior arcade which rests on the two cross-vaults of the ground floor. Due to the sloping site, the ground floor is actually a basement in its rear part. The stairway to the upper floor rests on an arch which defines a small porch below. On the rear side of the house we have the typical stairway (*daraj*) to the roof, which commences at a distance from the ground. The special function of the roof explains this arrangement. In the dry season the roof serves as a working surface where fruits, cereals, raisins and pinecones are dried. Sometimes there are openings in the roof (*qafʿa*), for the direct filling of the silos below. In order to make the roof inaccessible to animals and passers-by, the stairway often is not carried down to the ground. The remaining gap is bridged by ladders (*sellom*) when needed. The roof may also serve as a sleeping area during the summer. Usually a temporary shelter is constructed (*bayt ṣayfī*) where visitors frequently sleep, separated from the family below (F15).

Example E7 is a two-storey house with barrel-vaults over the ground floor and an upper floor divided into rooms (*uwaḍ*, pl. of *ūḍa*). There is no stairway to the roof in this case.

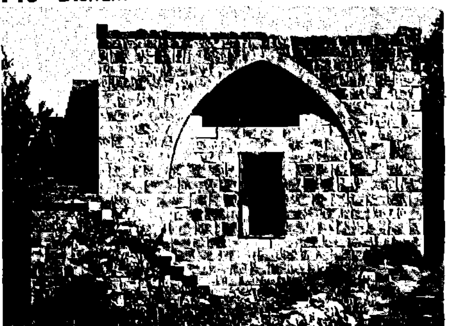
Example E8 shows a cross-vaulted one-storey building, typical of north Lebanon. Two cross-vaults in symmetrical arrangement form two spaces of 36 m² each. The stairway to the roof starts on the ground, turns around the corner and rests on a semi-arch over a stone corbel (F16, F17).

Example E9 consists of two barrel-vaults in the lower floor and two cross-vaults above. Although the upper vaults are closed by walls, they extend westward and form two arched porches — the beginning of an opening to the outside.

Example E10 shows a similar arrangement with four cross-vaults on the upper floor, but not closed by walls, although projecting bonding stones indicate that a closing wall was intended (F18). Life on the upper floor offered greater security and privacy, and made the opening of the rooms to the outside possible.



F15 Bterram



F16 From E8



F17 From E8



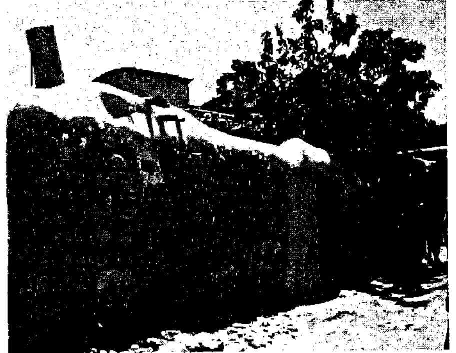
F18 From E10

B. CONSTRUCTION

EMPLOYING FLAT BEAM construction, the closed rectangular house constitutes the simplest way of creating a sheltered living space. In areas where timber is totally lacking, roofs are made of stone slabs (Hauran) or are constructed in the shape of domes, as in northern Syria (F19). Neither type of construction, however, is found in Lebanon.

The building technique in Lebanon combined bearing wall and skeleton construction. Bearing walls are used for the rigid enclosing elements, skeleton construction for the roof. The foundation (*byiftaḥu l-'asās*) is carried down to bedrock where possible, or at least a meter below ground, consisting of compacted loam and stones. The simplest type of exterior bearing walls (*ḥīṭān,* sing. *ḥayṭ*) are made of stones collected from the ground and piled up without mortar as dry masonry (*kallīn*). The thickness of such a wall is about one meter throughout and it consists of three parts: the exterior leaf (*hayt l-barraneh*), the interior leaf (*hayt j-juwwāni*) and the core (*rakkeh*) in between which is filled with rubble (*dabsh*) (F20). The outer face is usually built in horizontal ranges (*madāmīk*), the stones being roughly cut to fit on the outside while they are secured in place by wedge-like stone chips at the inner joints. The interior face is built less carefully since it will be covered by plaster.


F19 Forqloss, Syria


F22 Younine

An improved version consists of ranged masonry laid in mortar made of loam, if possible enriched with lime. This construction is called bonded (*msaffaṭ*). The wall thickness is reduced to about half a meter, with bonding stones frequently tying the outer and inner faces of the wall (F21).

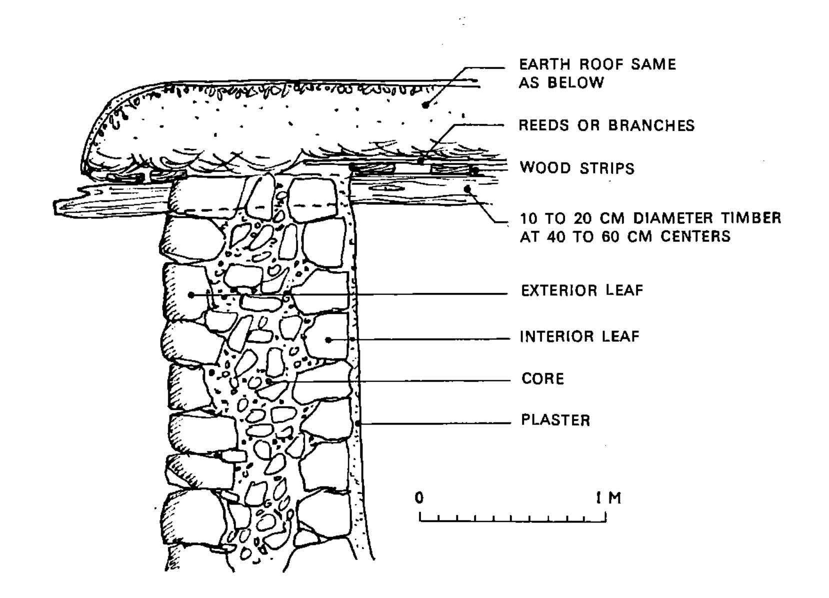

F24 Younine

F23 Younine

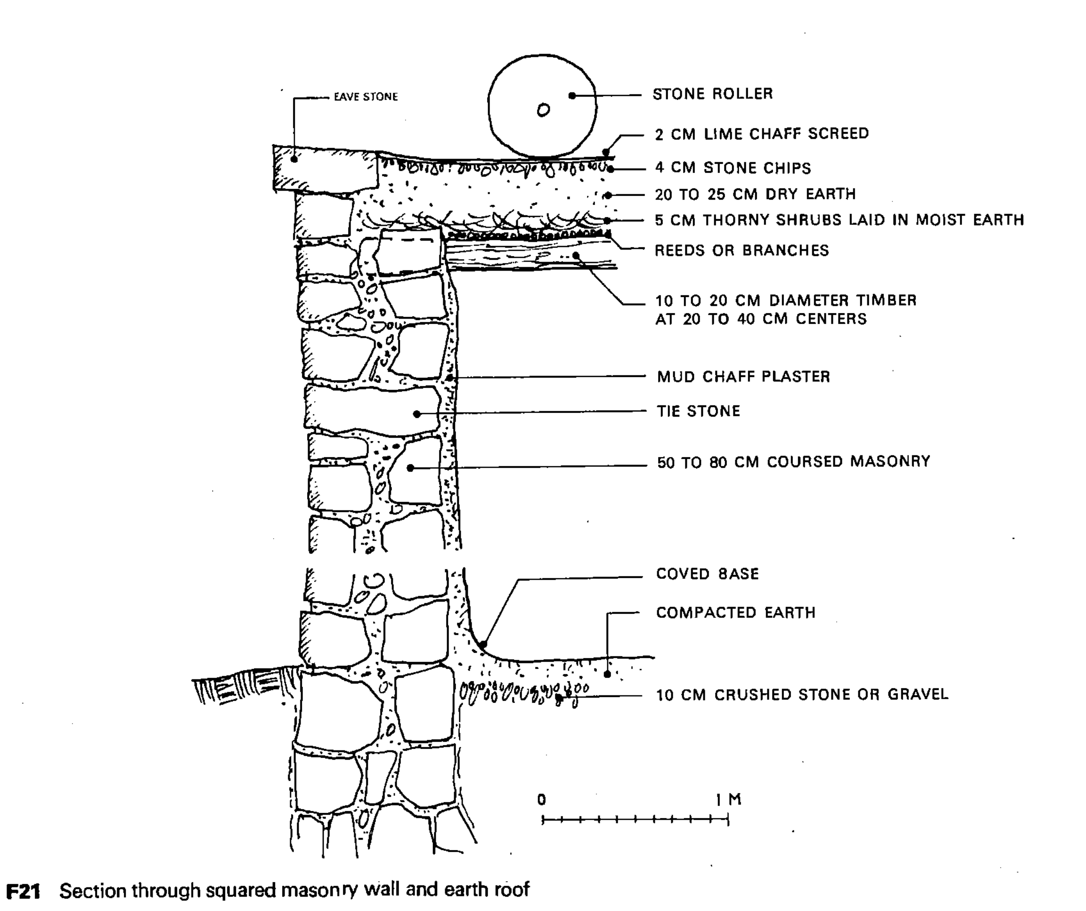


The interior plaster consists of a layer of loamy earth (*ṭīn*) mixed with chaff (*qaṣrīne*). There may be an additional finish coat of lime plaster (*ḥuwwāra*). Both are 3-4 cms. thick. Rounding out the corners, the plaster merges with the floor of compacted earth and usually continues to the outside around windows and doors (F22, F23). Buildings of mud brick exist only in the Beqa'a plain, but they cannot be distinguished from plastered stone buildings. The mud bricks (*libn*) are prepared in wooden forms from a mixture of loamy earth, chaff and water. The dimensions vary widely, and reach up to $30 \times 50 \times 15$ cm. The bricks are laid in bonds of headers and stretchers, and produce walls of about 80 cm. thickness.

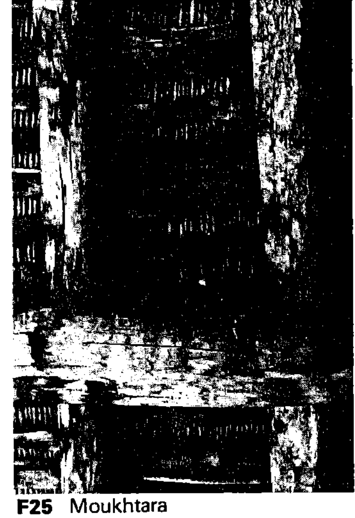
The roof (*saṭḥ*), if not vaulted, always consists of a flat timber structure with a topping of earth, 30 to 50 cm. thick (F20). The main structural element is a layer of logs (*wasleh*), 10-20 cm. in diameter, embedded in the exterior walls at 40-60 cm. centers. Long logs are usually left projecting on the outside (F24). The preferred wood for these joints is mulberry (*tūt*) or a kind of poplar (*zenzlakht*). Particularly zenzlakht is very resistant to decay. It was grown mainly for



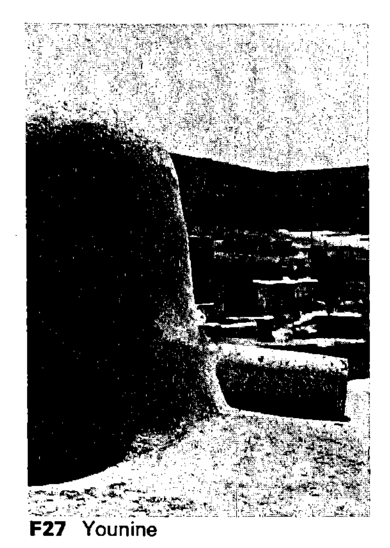
F20 Section through rubble masonry and earth roof

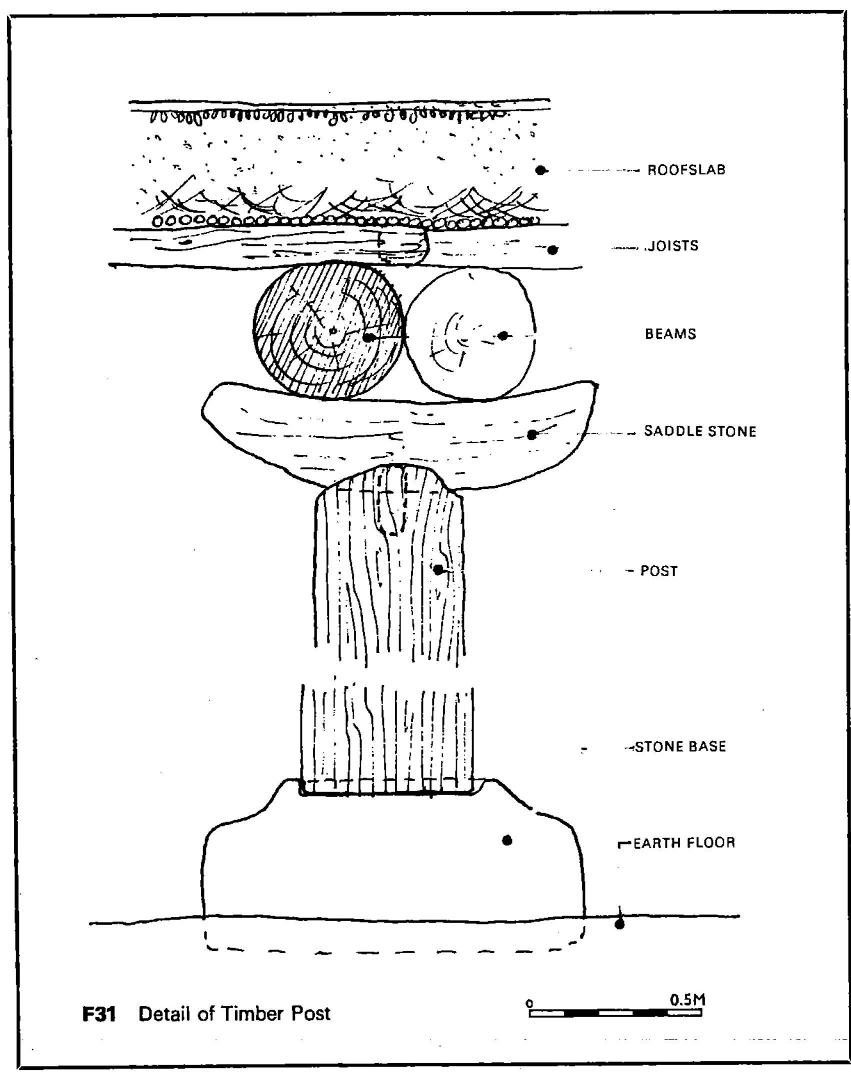


F21 Section through squared masonry wall and earth roof

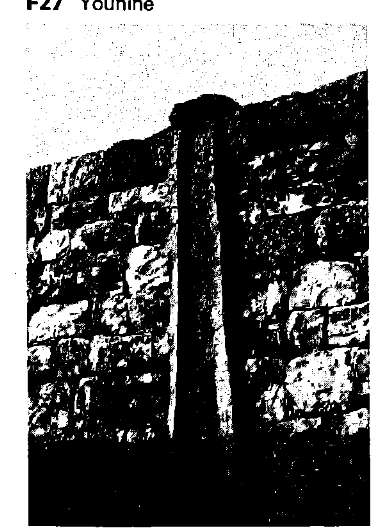

F25 Moukhtara


F26 Ebl es-Saki


F27 Younine



F31 Detail of Timber Post


F28 Kfar Shima


F29 Bchatfine

its leaves which are an excellent fodder for cattle, while mulberries were abundant during the time of silk production.

On top of the logs and running crosswise there is a layer of light or heavy twigs (*qauf*), the size used depending on the distance between the logs. Reed matting or flat wood chips are frequently used instead of twigs. Sometimes wood-strips and a counter-layer of reeds are added (F25).

Above this there is a layer of thorny brush (*bellān*), growing abundantly in Lebanon, which is pressed down with moist earth (*trāb*). This produces a relatively crack-proof slab under which the timber structure can move freely. The surface of the slab is so constructed as to slope towards a water spout (*mezrāb*). On top of this a layer of crushed stone (*huwwāra*) is rolled in, and sometimes a lime-chaff mixture is rubbed on. Such a roof has a k-value of at least 1 kcal/$m^2h^\circ C$, which is sufficient thermal insulation for summer or winter. However, a roof of this kind requires constant maintenance, especially after dry periods when it begins to rain. Therefore, thorough rolling is necessary so as to close any cracks which may have formed. For this purpose stone rollers (*maḥādel,* sing. *maḥdaleh*) are kept on most roofs (F26). Chimneys are usually slightly raised openings, sometimes there are high chimney heads (F 27), but usually the smoke is expelled through ventilation holes in the walls. Waterspouts are rare, and the water is usually collected in cisterns which catch the rain as it streams down the walls (F 28).

Because of the weight of the roof (at least 500 kg/m^2), the span of the logs is normally limited to 2,50-3,50 m. Larger spans necessitate the use of girders. For these, strong timbers of up to 50 cm. diameter are used. Long girders (*jisr*) sometimes have additional supports which may be placed off center towards the thinner end of the log (E2). Increased use of pillars leads to a system of main and secondary beams, which normally follow a grid of 3 × 3 meters. The pillars (*'umdān,* sing. *'amūd*) are either of wood or stone. Wooden pillars always rest on stone bases, and usually have saddle pieces which run parallel to continuous beams (F29, F30). If beams are joined above a pillar, they are generally staggered, and rest on curved saddle pieces which run in a crosswise direction (F31, F32, F33). All these connections are made without ties, since the roof is heavy enough to stabilize the structure. What is especially interesting about this system of construction is that it utilizes every part of the tree which has been felled for building material.

Stone pillars consist of upright stone prisms, with a cross-section of about 40 × 40 cm., which are usually plastered (E3). This dimension is sufficient to butt-join the beams on top (F34). Refined pillars of cut stone allow the reduction of the cross-section to 25 × 25 cm., and this naturally means slender columns (*sham'at*). Columns may have saddle pieces on top

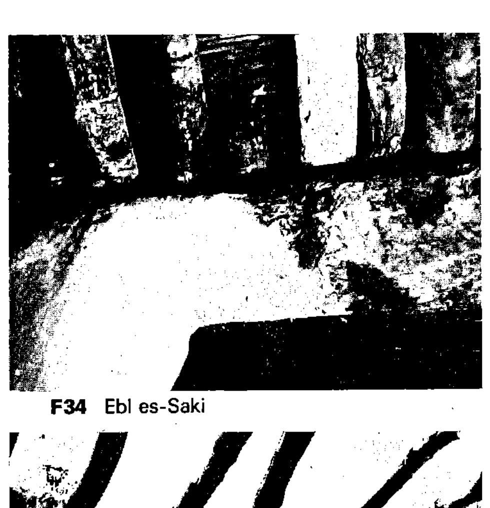


F30 Kfar Nabrakh

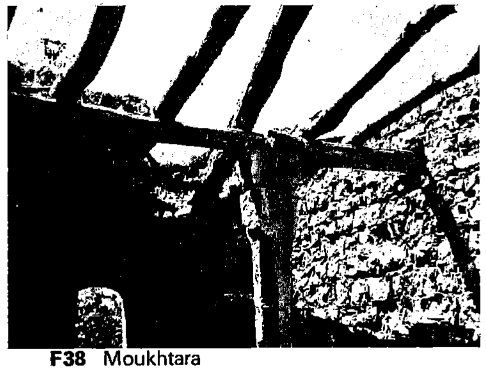




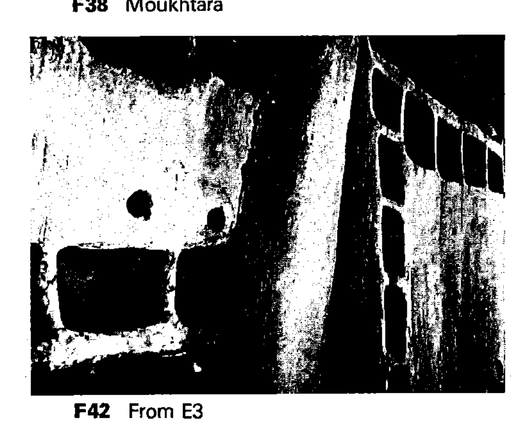
F33 Younine



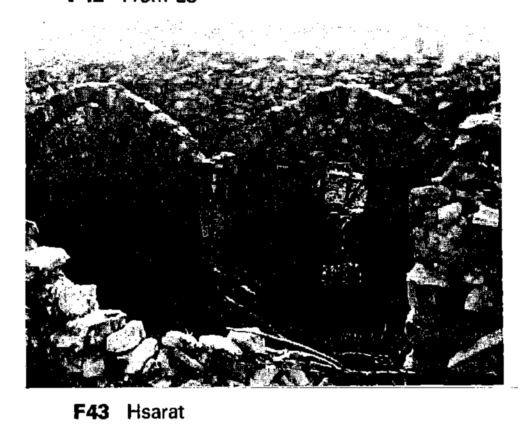
F34 Ebl es-Saki



F38 Moukhtara



F42 From E3



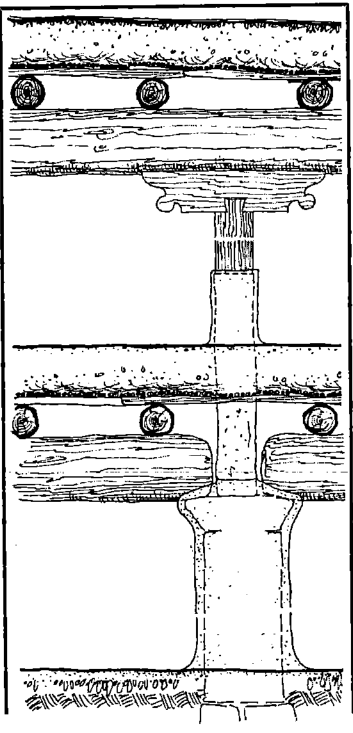
F43 Hsarat

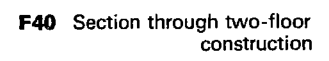


F35 Younine



F37 Aarbaniye

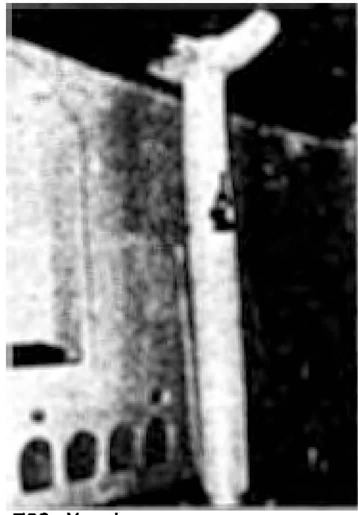




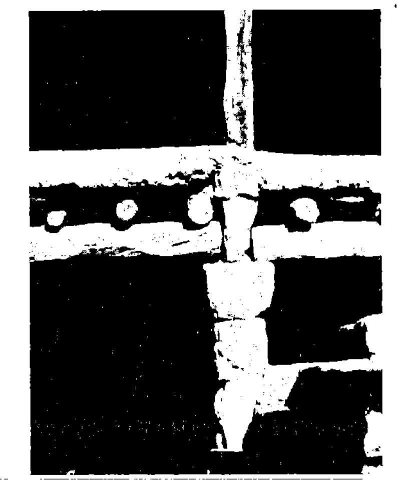
F40 Section through two-floor construction



F36 Younine



F39 Younine



F41 Akoura

(F35) and rest upon accentuated bases (F36), sometimes they have prismatic capitals (*tāj*) (F37) or even a sort of pulvin (F38). Supports can be very slender since there are no lateral forces to take into account (F39).

Earthslabs on timber beams may also serve as floors in two-floor construction. In that case the pillars of the upper floor continue from the ground floor up, the ceiling beams of the ground floor resting on projecting corbels of the pillar. This way shrinkage or decay of the floorbeams does not affect the stability of the roof support (F40, F41).

Built-in cupboards, silos etc. are built separate from the supports, and are usually not carried up to the ceiling (F42). The floor of the house (*arḍiyyeh*, from *arḍ* "earth") is either made of compacted earth (*dabbeh*) only, or has an additional layer of *ṭīn*, a mixture of chaff, loam and manure which is covered by a finishing screed of lime mortar (*ḥuwwara*). The surface is smoothed with a trowel and sometimes polished with a piece of marble, after an application of oil and soap.

The next step in structural development involves the replacement of beams and columns by arches (*'anaṭir*, pl. of *'anṭara*). The arches are buttressed by the exterior walls and rest on low stone pedestals (*qa'deh*) which are well embedded in the floor. Arches are constructed by means of wooden shuttering (*qaleb*) which is removed after the keystone (*ghalaq*) is placed and they eliminate the need for strong timber beams. They are a step towards the replacement of perishable wood by permanent stone and mark the transition to vaulted construction (E4, F43, F44).

The abundance of stone in Lebanon, together with the tradition of stone construction which has been firmly established since Roman times, explain the predominance of pure stone masonry designs. This includes the application of vaulting (*'aqd*, pl. *''ūd*), a technique furthered by the scarcity of timber as well as by a desire to build to last, vaulted construction being more durable than the more primitive building methods described above. From the barrel-vaulted single cell (E5) developed the cross vault, usually with pointed arch form (E6, E7, E8, E9). Cross vaults are designed as groin vaults, ribbed vaulting technique never being employed. Workmanship is generally of the highest order, even in modest houses. Groin vaults usually have a span of 4-5 m. at a height of 3-5 m. and subdivisions are always placed on the axis of the system. The vaults are flanked by strong abutments (*da'māt*, sing. *da'meh*) and the ends are closed by 40-50 cm. thick wall panels, which sometimes leave the face of the vault exposed, but at other times hide it (F45). Peripheral piers which are subject to thrust are generally correctly placed with their longer dimension parallel to the force, and are about 2 m² in cross-section (E10). Inner piers under pure compression are often designed as columns (F 46).



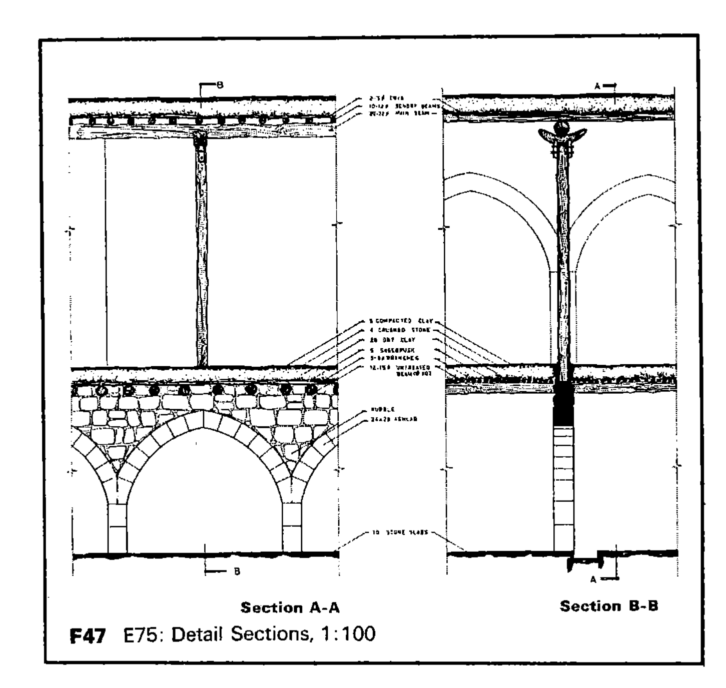
F44 Hsarat



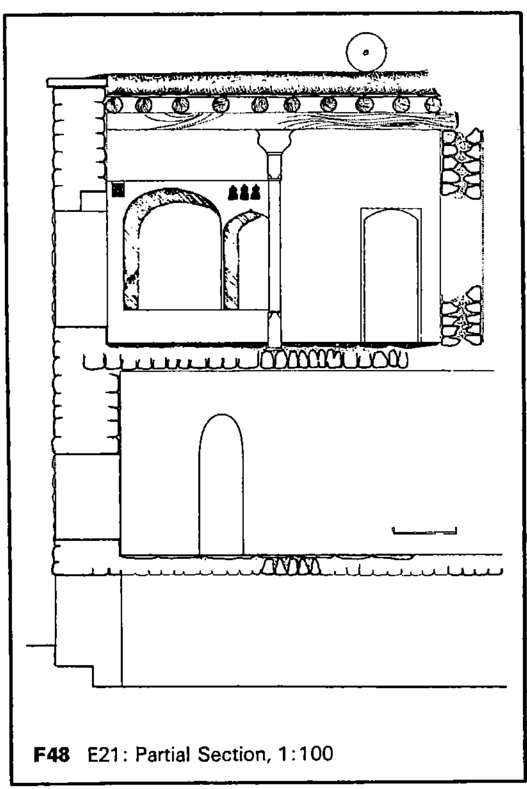
F45 Kfar Shima



F46 From E10



F47 E75: Detail Sections, 1:100



F48 E21: Partial Section, 1:100



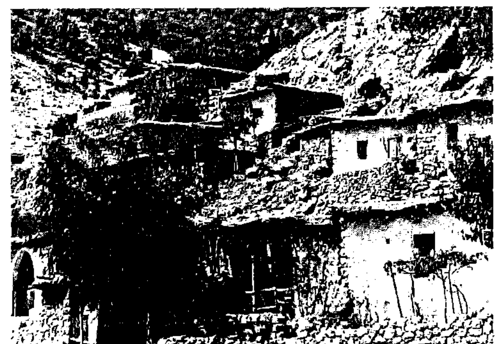
F49 Terraces in Olive grove



F50 Shepherd's shelter in the mountain

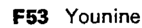


F51 From E3



F52 Ammiq





F53 Younine

F54 Village in the Akkar region

Quite often interior walls and piers are finished in finely cut ashlar masonry till slightly above the springing line of the vault from where on the vault is built with roughly shaped wedge like stones. Usually the rough upper part is plastered over flush with the ashlar masonry and the laborious cutting of exact voussoirs is avoided.

Vaulted construction is important because it permits an upper floor to be added without any restrictions. The upper floor, which generally has a flat roof and therefore flexible subdivisions, will not need to relate to a system of columns below. Thus it is eminently suitable for habitation (E7).

F47 and F48 are examples of two-floor construction. F47 shows an arcaded ground floor and a flat-roofed upper floor; F48 has a vaulted ground floor and a flat roof on stone columns above.

Upper floors are rarely vaulted, though a fine example is given in E10. The building is not used today, and for some unknown reason the enclosing walls are missing (F18).



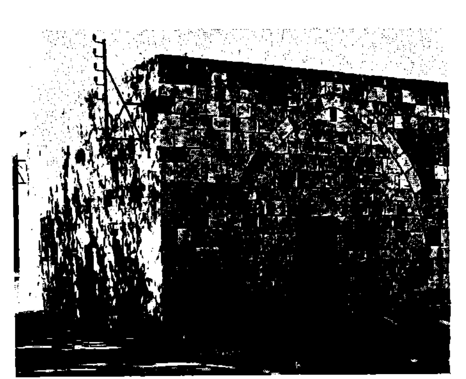
F55 Aarbaniye

C. EXTERIOR DESIGN

THE CLOSED RECTANGULAR house developed from the walled-in open space. Such walls consisted of dry rubble construction. Even today we find walls which are bonded in a fish-bone pattern. Dunand calls this "*L'appareil en épi*"[12] (F22, F49). Setting masonry like this strengthens the bond and lessens the likelihood of cracks. This type of masonry forms an organic whole with its environment (F50). The same is true for the closed rectangular house in general. Materials for construction are obtained from the site and the simple, closed shape of the house merges easily with the natural background.

Some differentiation is introduced with the use of plaster, which is either carried as a frame around openings or over the whole main facade (F12, F13, F51, F52). Usually walls of courtyards are plastered, but simple whitewashing of stone walls is seldom seen. Projecting eaves, the crooked ends of roof timbers and the irregular pattern of ventilation openings (often there are also pigeon holes) enliven the appearance of the house (F53). Openings are always secondary to the closed predominance of the wall, giving the house a fortress-like character which reflects the function of the house at this stage. Particularly appealing is the grouping of houses on the hillside, giving a rich interplay of cubes and prisms (F54).

With the adoption of cut masonry construction the conscious treatment of facades begins. The development ranges from quarry-faced masonry with wide joints (F55) to smoothly cut squared stones, with hardly a visible mortar joint (F56). An important element is the external staircase, particularly when it terminates in a semi-arch (F17, F57). The increased use of vaulting gives these buildings uniform proportions,



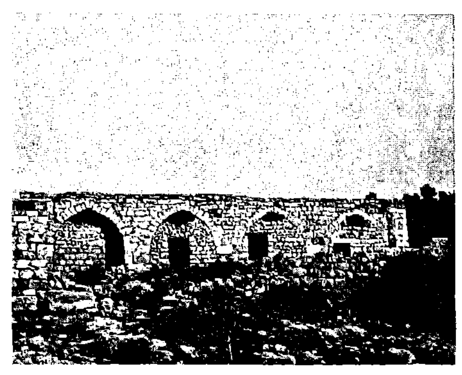
F56 Bterram



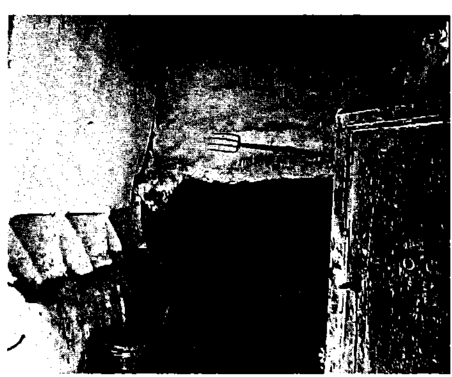
F57 Bterram

and establishes axes which have to be taken into account for the design (F58). Above all, the construction of two floors increases the importance of the facade (E7, west elevation). In general, the predominantly hilly character of Lebanon decreases the importance of courtyards and external enclosures, but increases the value of facades. However, the design of elevations in the proper sense is rarely seen in the closed house type.

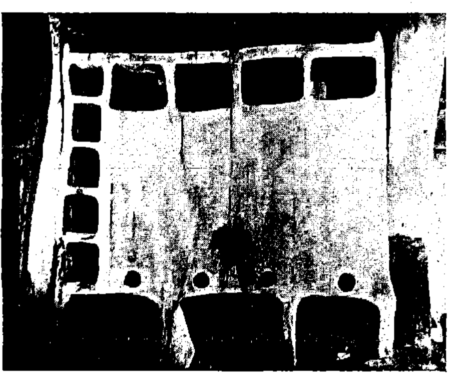
D. INTERIOR DESIGN



F58 Kfar Shima



F59 From E3



F60 From E3

THE MOST REMARKABLE aspect of the closed rectangular house is its interior design. Since the house is closed to the outside and has to serve many functions, the interior is profitably treated as one whole. This is easy to do in post-and-beam construction, but arcades and vaults inhibit the free disposition of space.

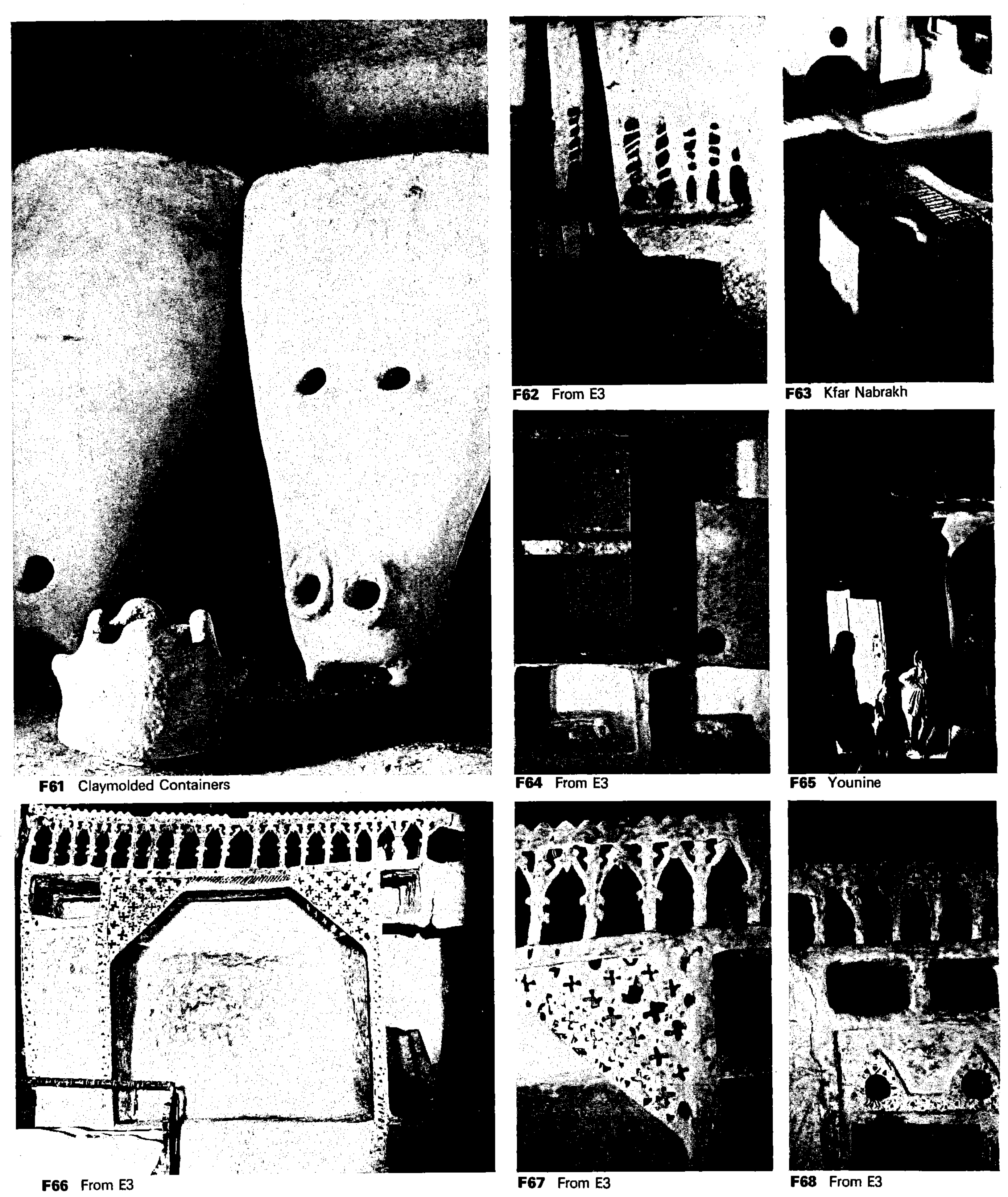
i. SERVICE SECTION

In the stable the mangers (*ma'laf*) are modelled in clay or cut out of stone (F59). High quality fodder such as barley or bran is kept in silos (*kuwwārāt*), which are usually placed directly above the mangers. On the top there is a large opening; at the bottom a small round tap (F60). The silos are either built of mud brick or are basket-like wooden structures embedded in loam (F61). There are built-in cages for the chickens, sometimes with connections to the outside, sometimes only accessible from the top. The floor of the cages consists of a wooden grille, with a space for the droppings below. When possible the service side faces the clean area, while the dirt compartment opens to the stable (F62).

ii. LIVING SECTION

The living area is generally raised and surrounded by built-in furniture, which is designed to serve the function of the adjacent space (F63). Frequently these elements open to both sides. Next to the kitchen area are small silos for cereals, small cupboard units with wooden doors and chicken cages (F64). The most important element (*yūk*) defines the living area, which serves during the night as sleeping space. It consists of a large niche with a horizontal or curved ceiling, and is used for storing mattresses and blankets in the daytime (F65, F66). Additional shelves, compartments and containers are included as necessary. Since the *yūk* dominates the living space it often receives artistic decoration. The construction consists generally of a plastered wood skeleton, the vertical sticks of which may be continued at the top and ornamented with decorative fretwork or lacey designs (F67). The plaster may be decorated with reliefs which are stamped on with wooden molds while it is wet (F68, F69).

As a rule, all separating walls are designed as storage elements (F70, F71). Wooden wardrobes are rare (F72). The house usually includes a small cool space, which is lower



F61 Claymolded Containers

F62 From E3

F63 Kfar Nabrakh

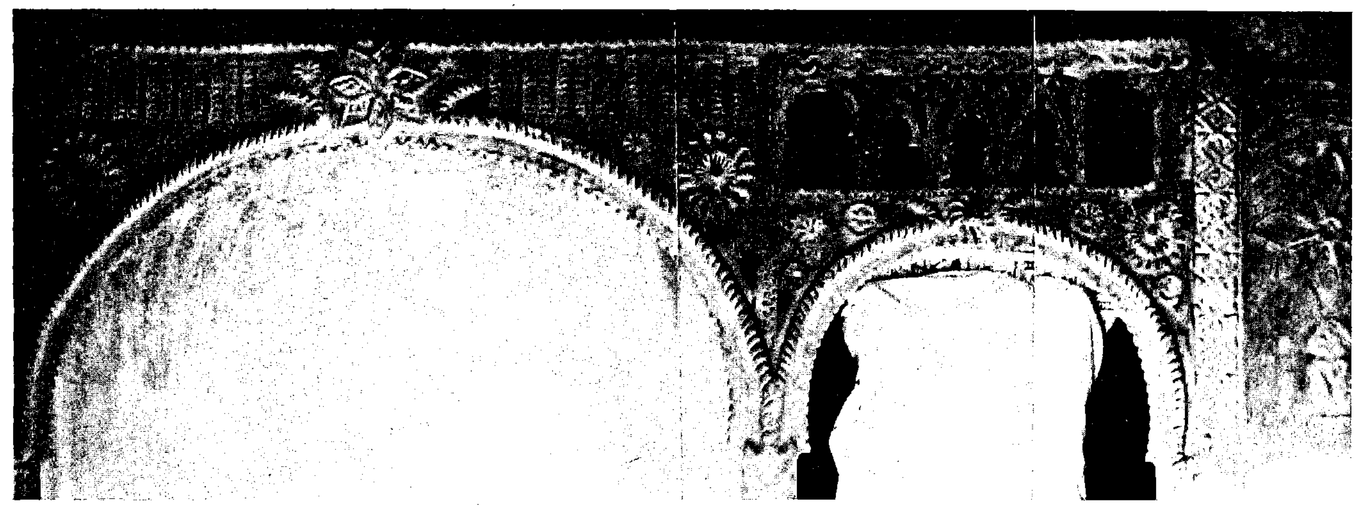
F64 From E3

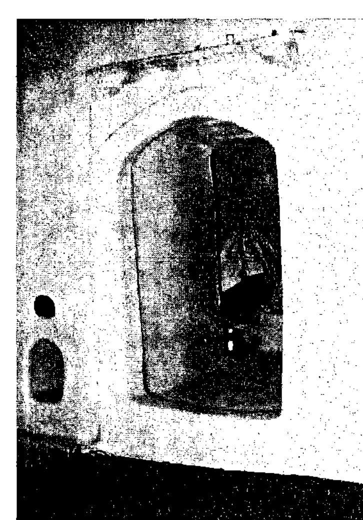
F65 Younine

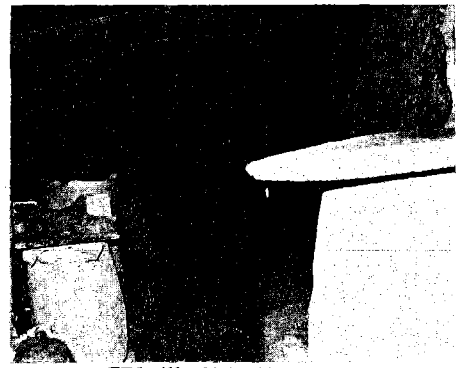
F66 From E3

F67 From E3

F68 From E3


F69 Kfar Nabrakh


F73 Younine


F74 Kfar Nabrakh

than the level of the rest of the house, with a small door and without a window. Here oil and olives, milk products and meat are kept (F73, F74). The massive construction of the houses constitutes an excellent thermal insulation. Continuous ventilation is maintained by numerous small openings (*ṭāqāt*), situated slightly below the ceiling to avoid drafts (F75). During the winter these holes are plugged with rags. For heating purposes charcoal may be burnt in small clay stoves (*maw'ad*), or a fire of dried manure and brushwood is lit in the chimney. If the stable opens on to the living space, the animals' warmth will provide sufficient heat.

There are never any sanitary installations inside the homes. At the most there is a floor toilet in a corner of the yard, but since the houses are next to open land even this amenity is usually lacking. Individual wells or running water supplies are very rare. Water is either fetched from the village fountain in large jars and stored near the house's entrance, or there is a cistern to catch the rain water.

Most remarkable is the harmony of materials, colors and textures achieved in the interiors. The shell-like unity of floor and wall, the soft merging of surfaces, lend a flowing continuity to the space so defined. The articulation of interior space is enhanced by the absence of large detached pieces of furniture, by the different levels of the floor, and by the strong sculptural design of the partition elements.

We can feel the presence of the human hands which have shaped all the details, and the lack of straight lines or right angles lends an organic, artistic quality to the interior. However, there is no play of empty forms, and Sullivan's dictum: "form follows function" is fully applicable. That functional form can be well combined with ornamentation is equally clearly demonstrated, as it is in Sullivan's own work (F66 or F69).



F70 Kfar Nabrakh



F71 Ebl es-Saki



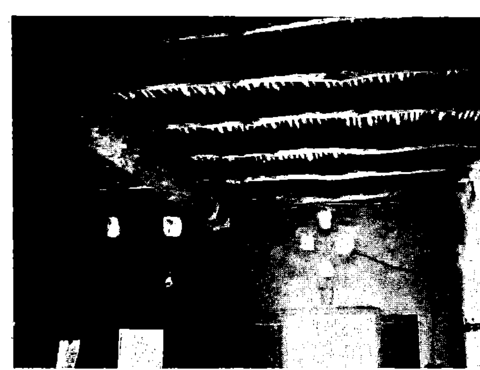
F72 Kfar Nabrakh

When posts and beams are replaced by arches, the arcades with their full spandrels reaching up to the ceiling introduce a degree of subdivision which was absent before. Consequently, the flexibility of internal planning is reduced.

Once fully vaulted construction is adopted, internal spaces are totally predetermined. Simple barrel vaulted rooms may be subdivided at will into series of cells along their axis, while cross vaults more or less dictate a square room configuration.

In vaulted construction we may have partition walls of mud brick with cupboards and the like, but the stone walls predominate and give a more rigid character to the interior. Recesses for cupboards and smaller niches, often finely decorated are also provided in stone walls.

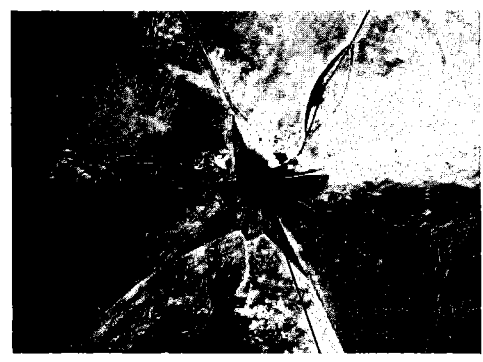
Good stone masonry will not be plastered over but rough vaulted ceilings usually are, inviting decorations in shapes appropriate to the vault pattern (F76).



F75 Aarbaniye

E. ORIGIN

IN BYBLOS we can see archaeological evidence of the closed rectangular house.[13] There are numerous rectangular slabs, defined by low walls of two courses of fieldstones, and about 2,5 to 4 m. long and 2,5 m. wide. They consist of a layer of fist-sized pebbles which are embedded in clay and covered by well polished lime screed. Maurice Dunand estimates these remains as dating from 5000 B.C. (F77). Above this stratum we find burial jars from Chalcolithic times (ca. 3500-3250 B.C.). The dwellings of this period not only have rectangular or trapezoidal plans, but are also of circular shape, with diameters of 3 to 4 m. These are examples of monocellular buildings. Circular or oval plans necessarily create individual units. If the span is limited, enlargement is possible only along one axis, hence the evolution from the



F76 From E30

circle to the oval and thence to the rectangle (F78). It is interesting to note in this connection that the oldest rectangular buildings still have round exterior corners, while there are right angles on the inside (F79).

Between 3200 and 3100 B.C. we find a more definite organization of rectangular cells, which are often divided into three parts along their depth and, although still detached, are placed in groups. Floors are of compacted earth, and enclosing walls hardly rise above the ground, yet the stones used are not simply stones collected from the fields but sandstone slabs, on the average 15 cm. thick, and laid in a herringbone pattern. The stones come from a nearby quarry, and are sometimes fairly well squared — the beginning of cut masonry construction.

The regularly distributed baseplates of limestone which indicate the location of timber posts are of particular interest. There are not only individual posts in the center, but also corresponding posts along the walls. This indicates a new structural concept: skeleton construction. The wall is neither a supporting nor an infilling element, but wraps around outside the skeleton; it is only enclosing — with the exception of the corners, where there are no post foundations, since the angular form of the wall apparently gave it enough stability for support.

The importance of the corners in wall construction was early recognized. Foundations are deeper at the corners or consist of huge monoliths, while the value accorded to cornerstones may be seen in the Bible, Mark 12-10:

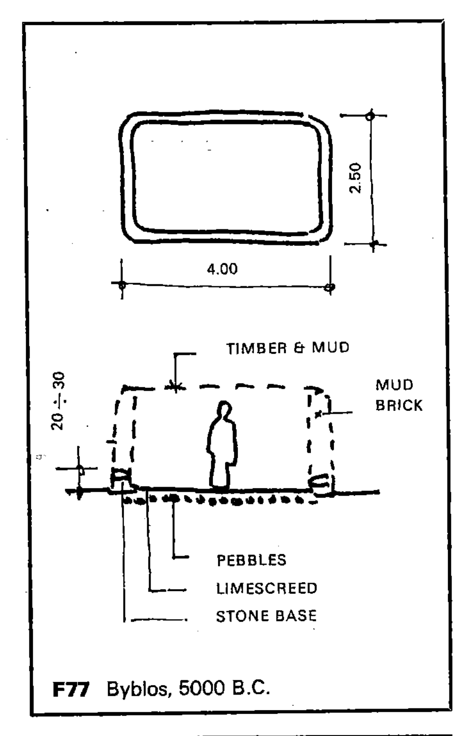
> "And have you not read this scripture: The stone which the builders rejected has become the head of the corner."

The distribution of posts is indicated by the bases. There is a great variety of arrangements; sometimes the middle post is placed eccentrically, in order to support the girder closer to its weak end (compare E2). This way we may get seven posts, a system which again is mentioned in the Bible: "Wisdom has built her house, she has hewn out her seven pillars."[14] (F79).

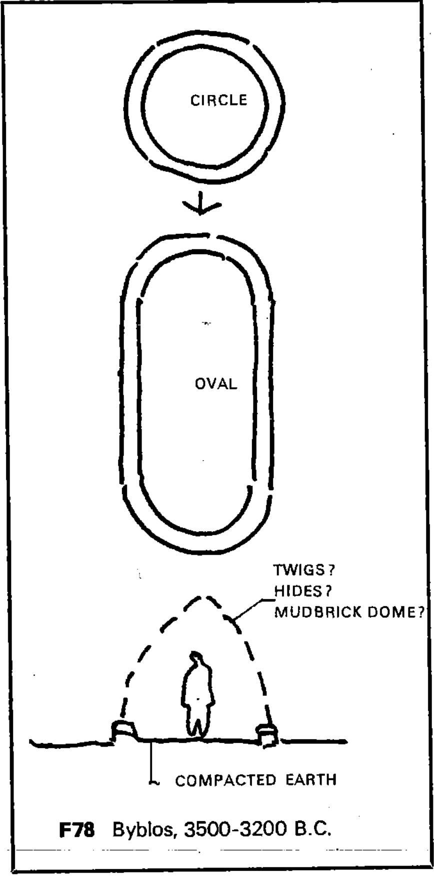
In conclusion one can say that carpentry — and with it skeleton construction — seems to have been dominant by the end of the third millenium, a phenomenon which possibly stems from the introduction of copper hatchets.

At the beginning of the second millenium Byblos developed into a city. Houses began to be grouped around courtyards or along streets, forming a tight agglomeration, conditioned by the lack of space within the city walls.[15] We may assume that houses, particularly in the Lebanese mountains, continued to be built in isolated locations as individual units.

For the year 1500 B.C. John Gray[16] gives a description of the Canaanite house which precisely fits example E3:



F77 Byblos, 5000 B.C.

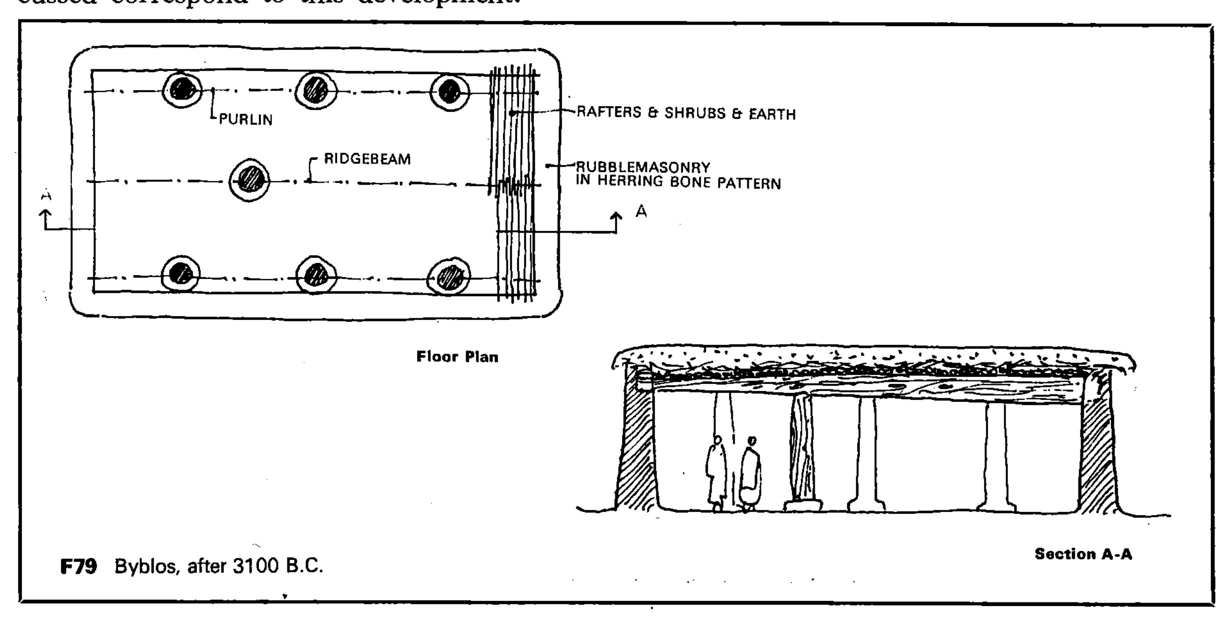


F78 Byblos, 3500-3200 B.C.

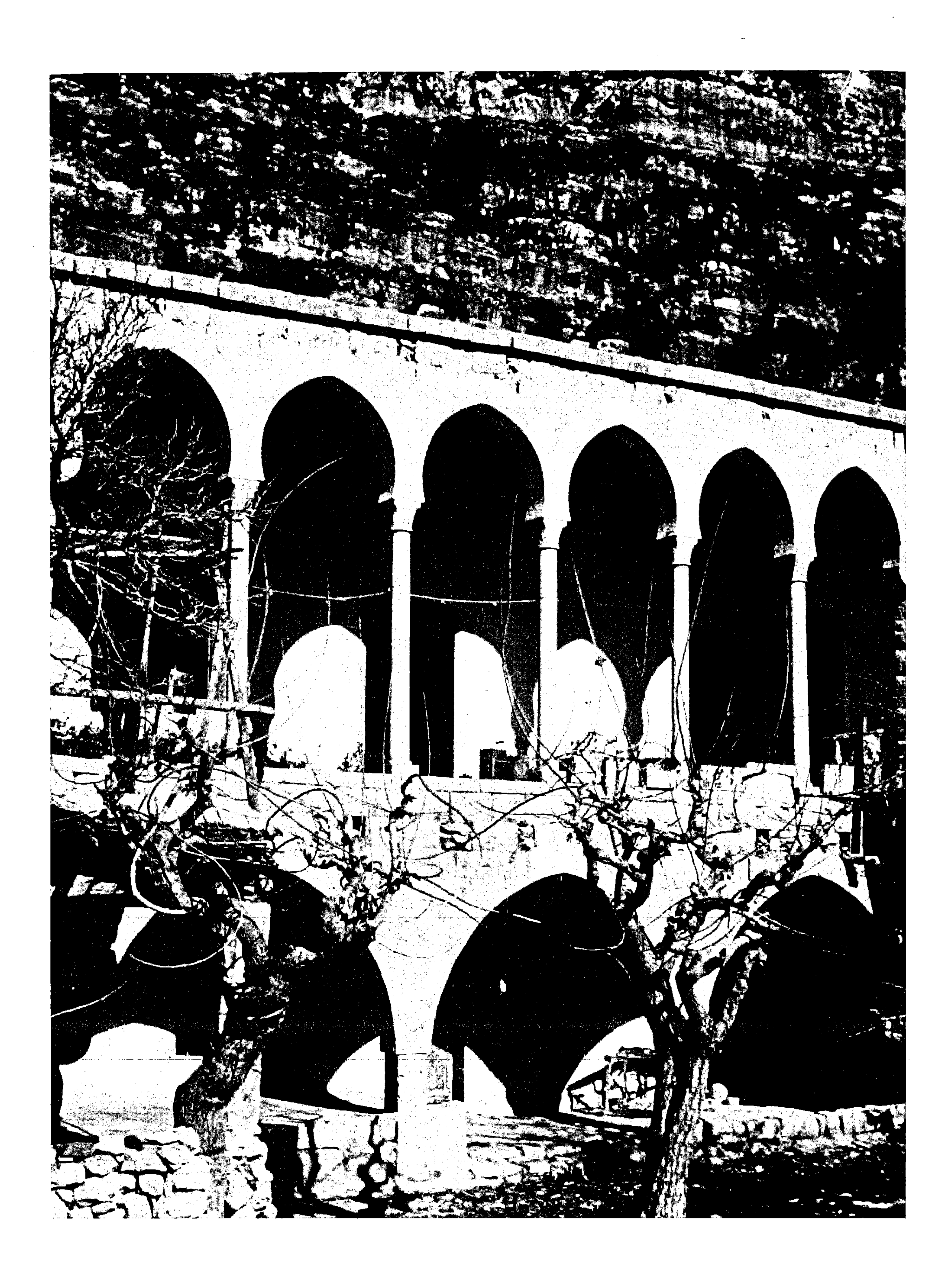
"By the second millenium houses were built rectangularly of clay or of bricks dried slowly and bound with clay mortar on stone foundations. The houses are generally small, the size being governed by the length of single timber beams which supported a light framework of timber or brushwood and a flat roof of rammed earth. The walls were protected against the weather by mud-plaster, and in the rainy season the surface of the roof, as still today, was kept unbroken by the use of a small roof-roller, which is occasionally found in excavations. Neglect of this domestic duty could cause serious annoyance, to which the Hebrew sage compares the railing of a nagging wife (Prov. 19.13) and a proper son is described in one of the Ras Shamra legends as one who plasters his roof on a rainy day."

Details for houses of later periods generally concern parts of settlements and not individual dwellings. Such houses are therefore subject to city conditions and are not to be compared with independent residences. Tchalenko shows a group of simple houses in northern Syria from the 6th century A.D. (F129.4). The units are grouped around courtyards, some have galleries, but again they are not detached and free standing.

Even today we can see all stages of the evolution from nomadic to settled life: before a house is built an enclosed area is formed; Bedouin tribes arrange their tents so as to create a protected open space; shepherds usually make walled-in spaces in the mountains where they keep their flocks overnight. One corner may be developed into a shelter, the house emerges as the roofed-over part of a yard (F50). The examples of rectangular houses which we have discussed correspond to this development.



F79 Byblos, after 3100 B.C.



2. The Gallery House



A. PLAN

The term gallery (*riwāq*), as we shall use it here, denotes a covered space which opens to the outside through a series of supports. The exterior supporting element may be a colonnade or an arcade. We can distinguish two types of such galleries. First there is the gallery as it exists in its passive form as the addition of a covered open space to a closed mass, such as an arbor (F80). In the Mediterranean court house this leads to the interior peristyle; in the detached building, to the porch and exterior peristyle.

The second type, the active version, is planned as an open corridor which serves as a distribution space or traffic area, linking different spaces with each other. The stoa was such an element, particularly when it had a row of rooms on the inner side. We shall see that it is this second type which characterizes the use of the gallery in the Lebanese house, and if a porch only serves as the extension of one interior

space, it should not be called a gallery. As a rule, the gallery will be greater in length than in depth, it will serve several rooms and be connected to the entrance of the house.

In Lebanon the house is either reached through a courtyard in front—this is the general oriental solution—or, more typically, directly from the open surroundings, since the prevailing sloping sites usually do not permit the creation of a yard. Furthermore, there is either a single-floor or a two-floor construction. Example 11 shows a two-floor structure, which is typical of the conditions imposed by the Lebanese hillside. The low ground floor backs into the slope and the house is only accessible from the front; the upper floor is raised above the ground on all sides. The timber gallery of the upper floor clearly forms the extension of a closed rectangular house, the roof of which extends for three meters and is carried by an external row of posts. There are several doors opening on to the gallery, even though the interior of the house forms one space.

In contrast to E11, E12 shows a house in the Beqa'a with a forecourt. Here two separate rooms open on to the gallery, which has three pointed arches. In both houses access is via the gallery.

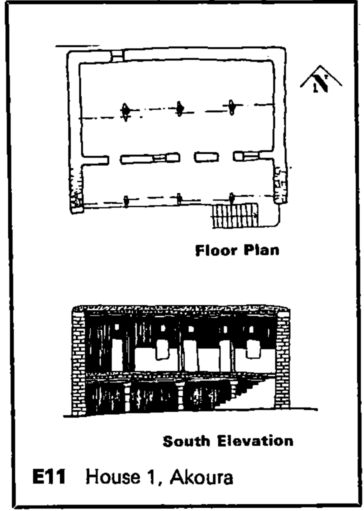
The distributing function of the gallery is very obvious in E13 and E14, where several individual rooms are co-ordinated into a single unit. In example E13 the arcade opens on to the garden; the entrance is on the western side. House E14 commands a fine view of the sea below the western slope; the gallery acts here as a shelter from the sun and catches the southwesterly breeze. These examples demonstrate two principal ways of planning a gallery: towards the inside, related to the garden or a yard, and to the outside, towards view and breeze. Of course, there are also cases in which the position of the gallery is solely determined by its traffic function.

Example E15 shows a gallery with groined vaults typical of commercial buildings in towns. The gallery adjoins the street and serves as covered entrance to the shops.

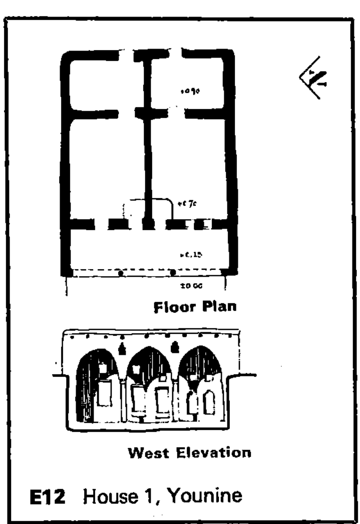
In the examples so far considered, the rooms were attached to the gallery in a linear fashion. Examples E16 and E17 show galleries which are surrounded by rooms on three sides. The gallery does not continue all along the facade, and cannot be identified as such at first sight. However, if we look at the plan, we see that the main access is through the arcade, and from this we may deduce the gallery principle.

In crowded village conditions where multifloor construction is the rule, the gallery is generally used in the upper storey. Examples 18, 19, and 20 show cases where the gallery is placed as an entrance at the corner of the upper floor. In example 18 the gallery is reduced to a pure traffic element designed to give individual access to the two rooms.

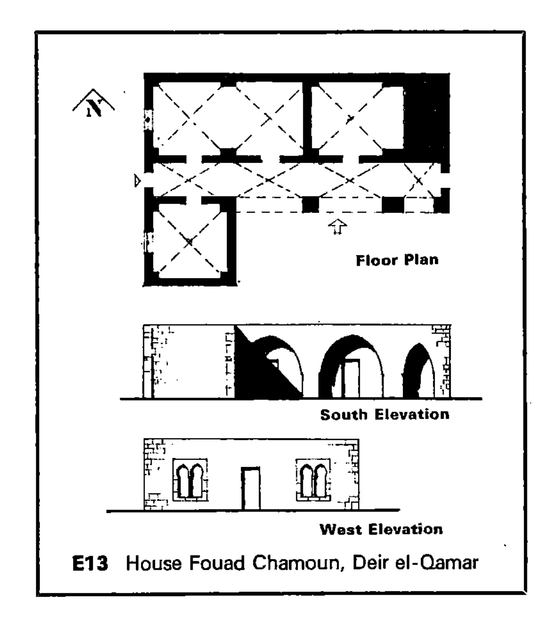

F80 Qnat



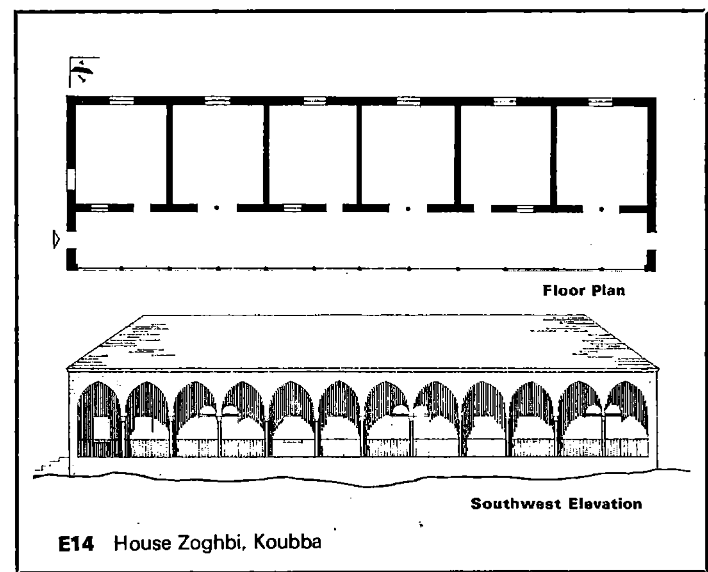
E11 House 1, Akoura



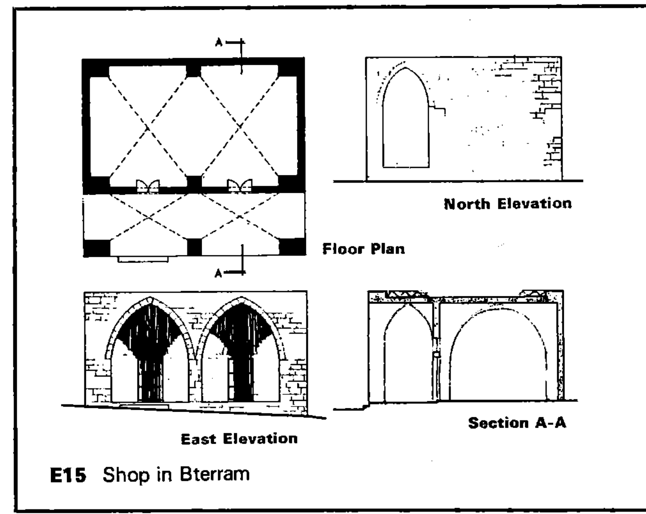
E12 House 1, Younine



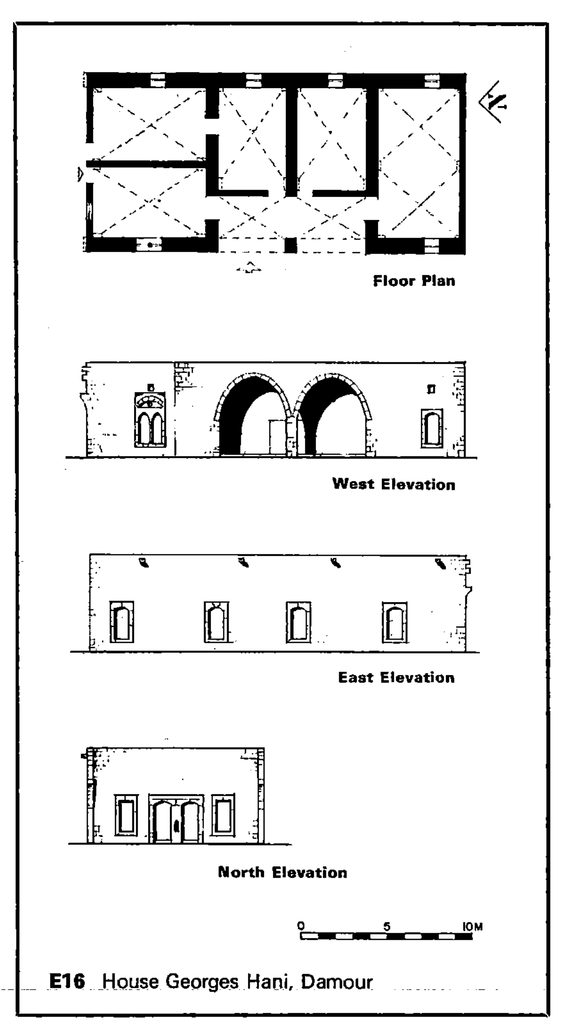
E13 House Fouad Chamoun, Deir el-Qamar

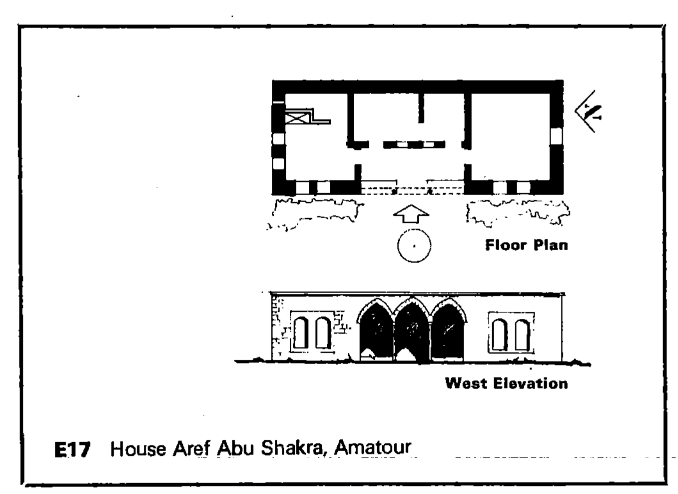


E14 House Zoghbi, Koubba



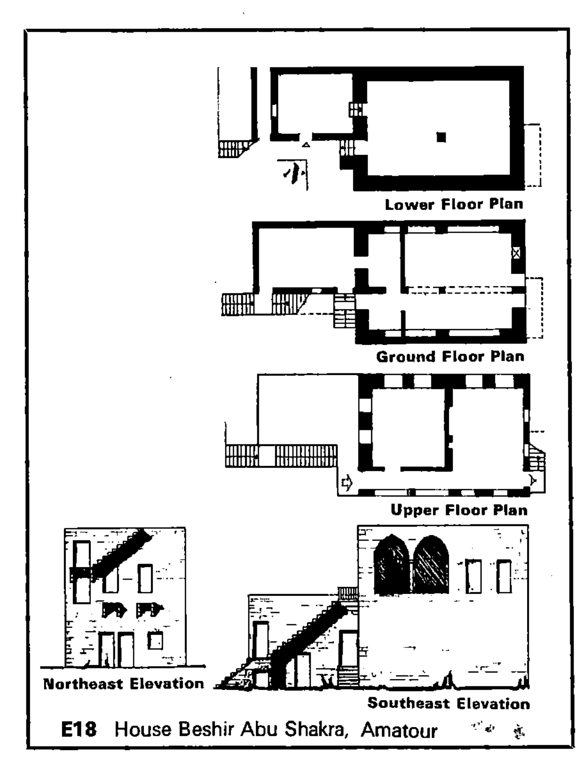
E15 Shop in Bterram



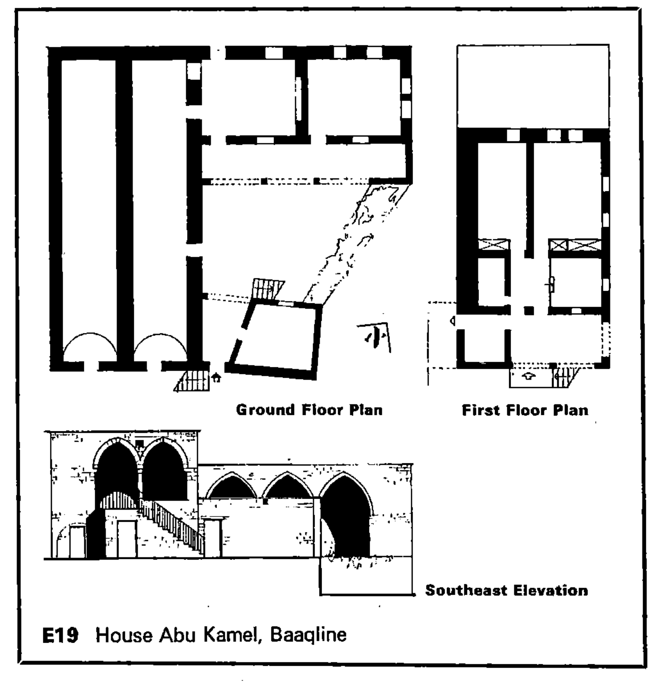


E17 House Aref Abu Shakra, Amatour

E16 House Georges Hani, Damour

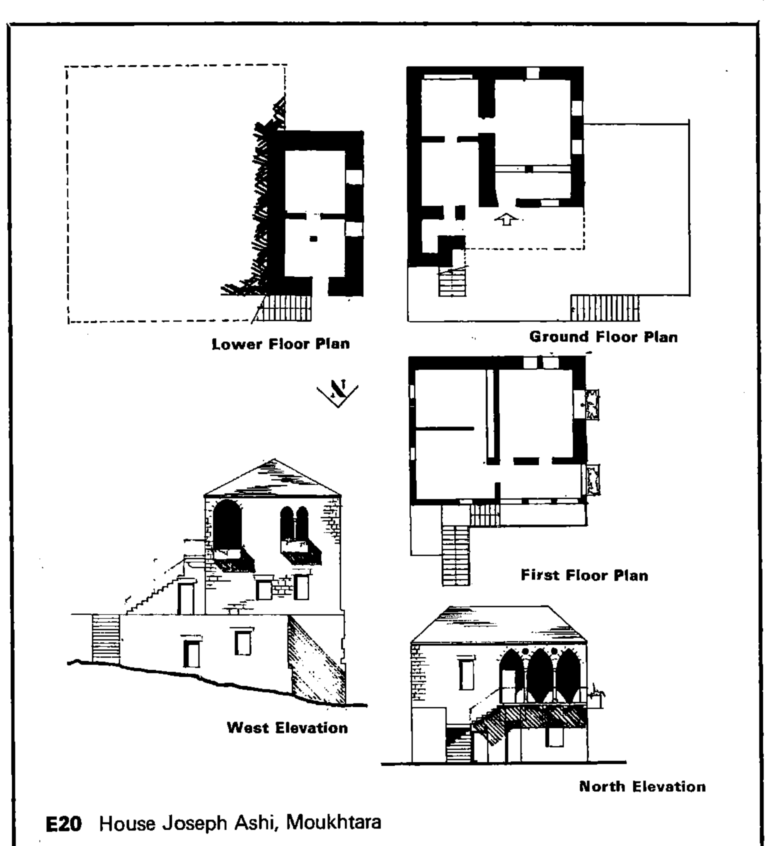


E18 House Beshir Abu Shakra, Amatour

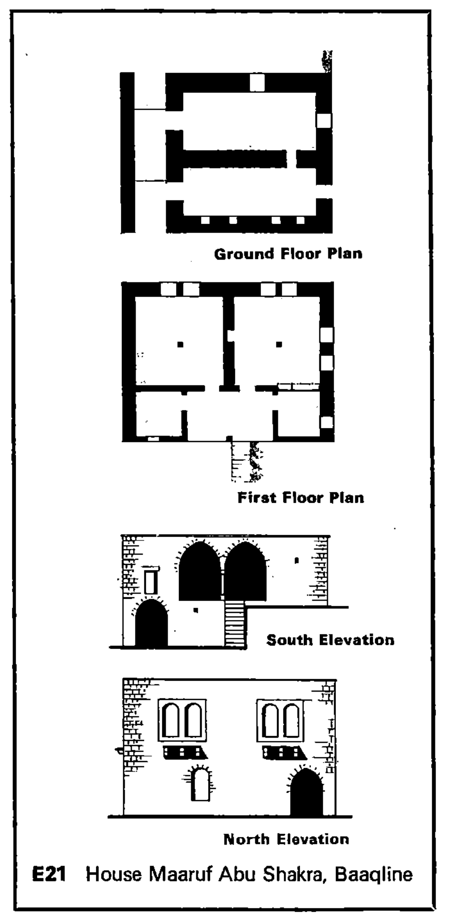


E19 House Abu Kamel, Baaqline

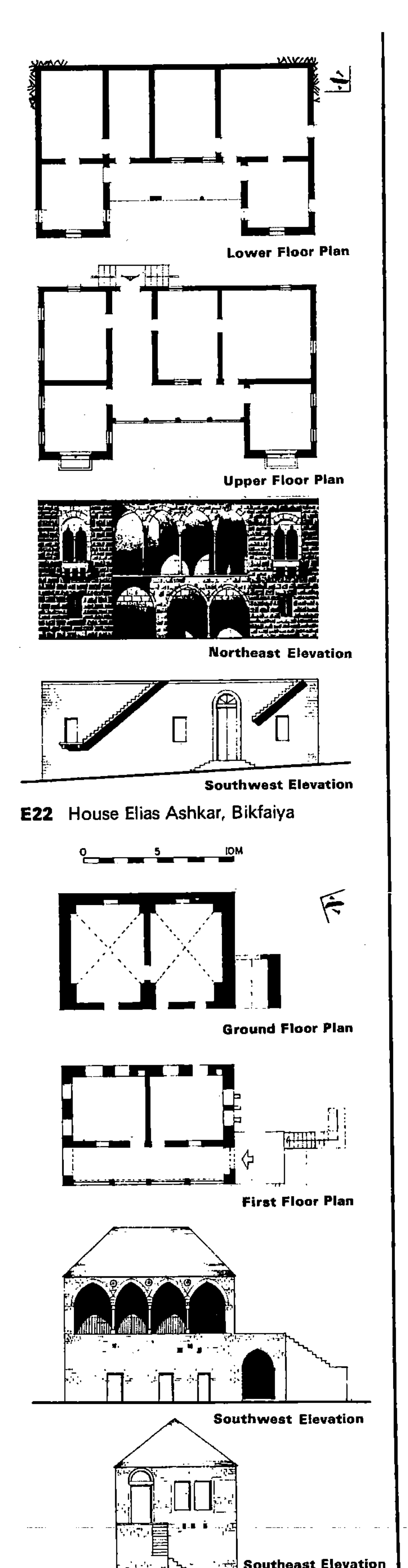
0 5 10M



E20 House Joseph Ashi, Moukhtara



E21 House Maaruf Abu Shakra, Baaqline



E22 House Elias Ashkar, Bikfaiya

E23 House Abd el-Baki, Ain Baal

In example 23 we see a repetition of the continuous gallery in front of two rooms, this time on the upper floor. Examples 21 and 22 show top-floor applications of galleries surrounded on three sides. Example 22 uses galleries in both storeys; as a result of the hillside location, the ground-floor gallery is reached from the valley side, the upper-floor gallery from the mountain side. In this case the upper gallery serves as access to the rooms in the projecting wings. Examples 20 to 23 reveal a strongly symmetrical composition, typical of many Lebanese houses.

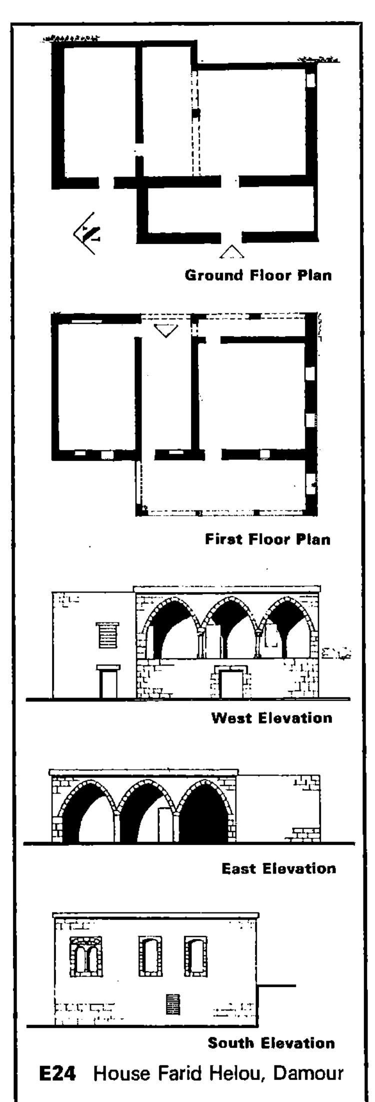
The following examples reduce the traffic function of the gallery. Examples 24 and 25 place the gallery on the valley side of the upper floor, while the entrance to the house is on the mountain side. All rooms can be reached from the hillside, while the gallery serves as a porch facing the valley, possibly with its own access, such as shown in E25. We can recognize a corridor connection between hillside entrance and valley-side gallery in examples 22 and 24. In E25 this corridor is enlarged to a wide hall, a phenomenon which we shall discuss later. In E26 the gallery itself is enlarged to a hall, which is used in this case as the school's recreation area. In E27 the gallery has the proportions of an entrance hall; today the access stairway has been removed and the house is reached through an annex.

Example 28 shows a combination of gallery and central hall. It should be noted that the entrance leads to the central hall, while the gallery leads to the living-room and small balcony.

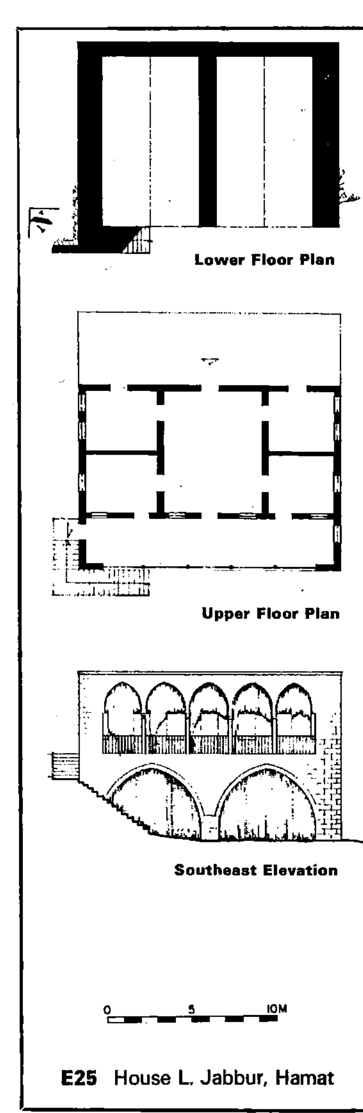
Several varieties of galleries are shown in house E29. On the ground floor there is a gallery in front of the service wing; on the upper floor the gallery on the north side serves as distributor to the rooms, and is continued at the south side as a covered porch facing the view.

Examples 30 and 31 offer two significant architectural solutions which have developed as a result of the prevailing hillside conditions in Lebanon. Both houses have ground floors which back into the hill, upper floors being accessible only from the hillside. The galleries have become the central motif, and the design is strongly symmetrical.

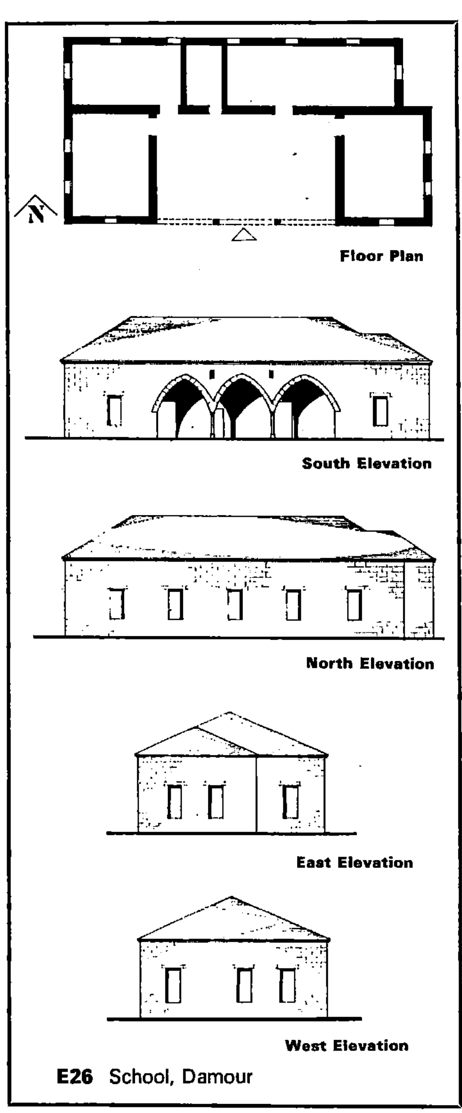
House E30 was built with a central corridor on the lower floor, which is balanced by four cross-vaulted, square rooms and a barrel vaulted space on each side. The front rooms are used for working and living; the rear spaces are used as stables. The front row of rooms with doors and windows which give on to the terrace are excellent living quarters, and most probably were the original dwelling of the owner. This is also indicated by the large middle-entrance with its entry hall, equipped with benches. Possibly this design has been derived from a liwan-scheme. The upper floor is placed quite independently on top of the lower floor, and was apparently constructed when the need arose, a practice still



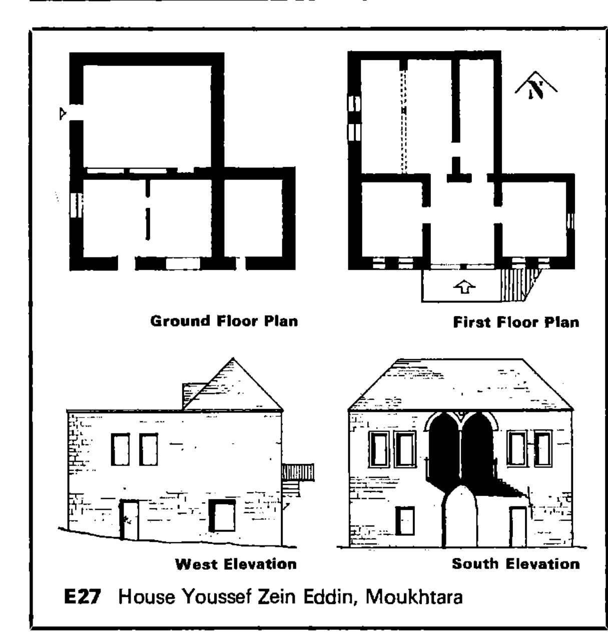
E24 House Farid Helou, Damour



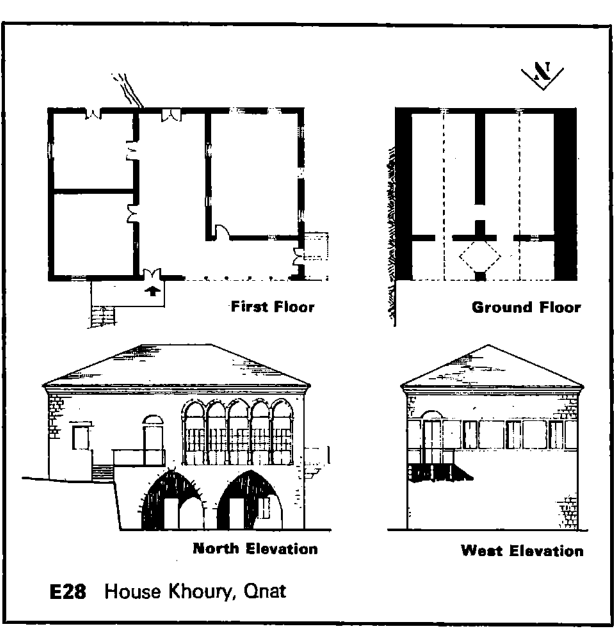
E25 House L. Jabbur, Hamat



E26 School, Damour



E27 House Youssef Zein Eddin, Moukhtara



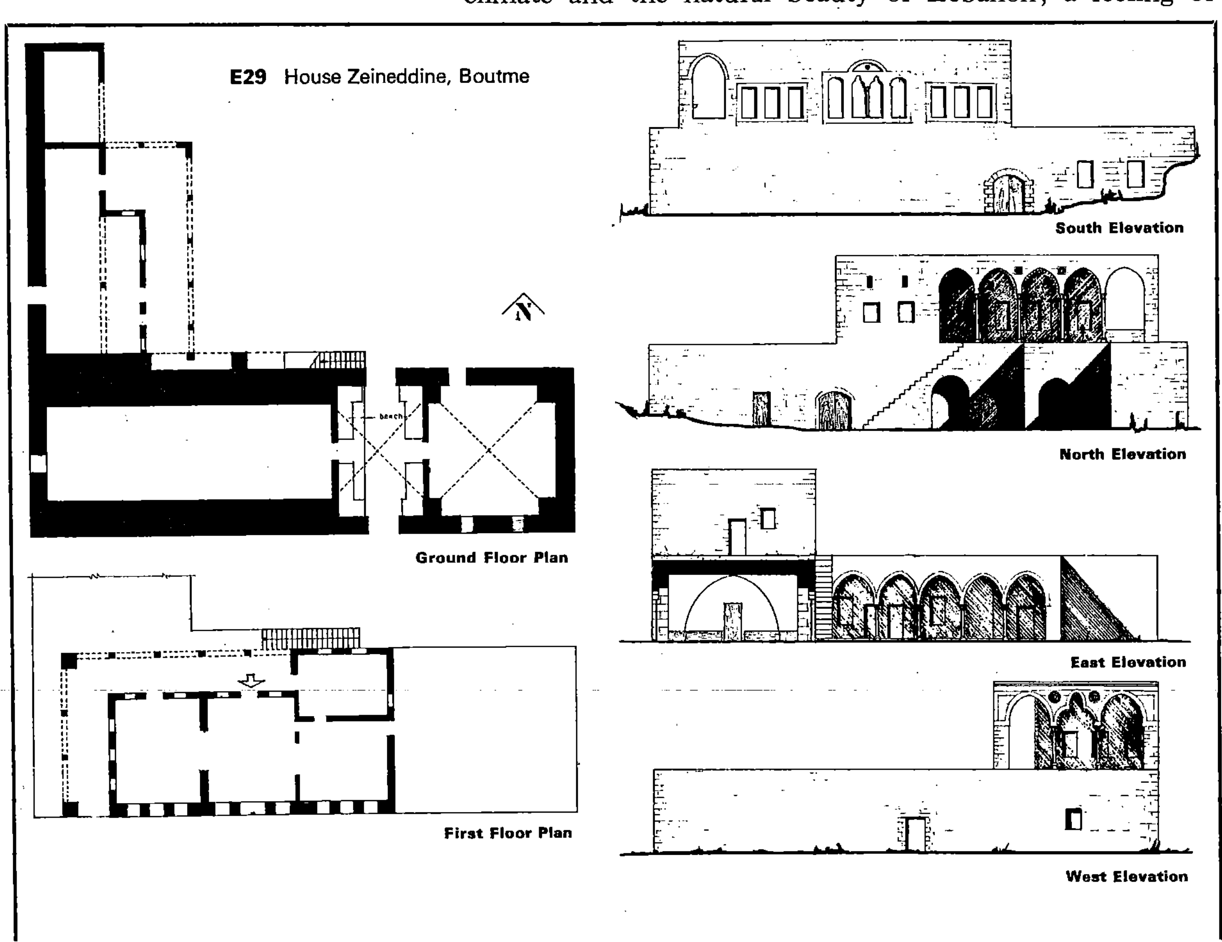
E28 House Khoury, Qnat

very common today. It follows the U-scheme around a gallery in perfect symmetry, and masonry details indicate that a further extension of wings was intended. Typically, there is no internal connection between the two floors, even the continuation of the lower corridor with a stairway up the hill is extraordinary.

House E31 is quite different. The upper floor was built on top of an unfinished palace. This explains the monumental gate on the southeast corner which was built by Younes el-Maʿni in the early seventeenth century. Access to the top floor is from the side, across the remaining roof surface of the ground floor. A small corridor leads to the spacious gallery, which opens on to a terrace flanked by two rooms. All rooms are reached from the gallery via liwan-like porches. The design is highly symmetrical.

A special type of gallery house developed at the end of the nineteenth century in the coastal cities, particularly in Beirut. Two to three storey houses are faced or surrounded with arcades on most sides. If we look at the plan, however, we see that the traditional central hall scheme is surrounded by galleries (E32, E33). The galleries cannot be reached from the staircases, only indirectly through the central hall and rooms. Apart from the formal effect, the main function of the gallery here is to provide a continuous balcony and shelter from the sun.

In contrast to the closed rectangular type, the gallery house expresses three major trends: Recognition of the mild climate and the natural beauty of Lebanon; a feeling of



security enjoyed by its inhabitants; and increasing emphasis on the differentiation of life within the family.

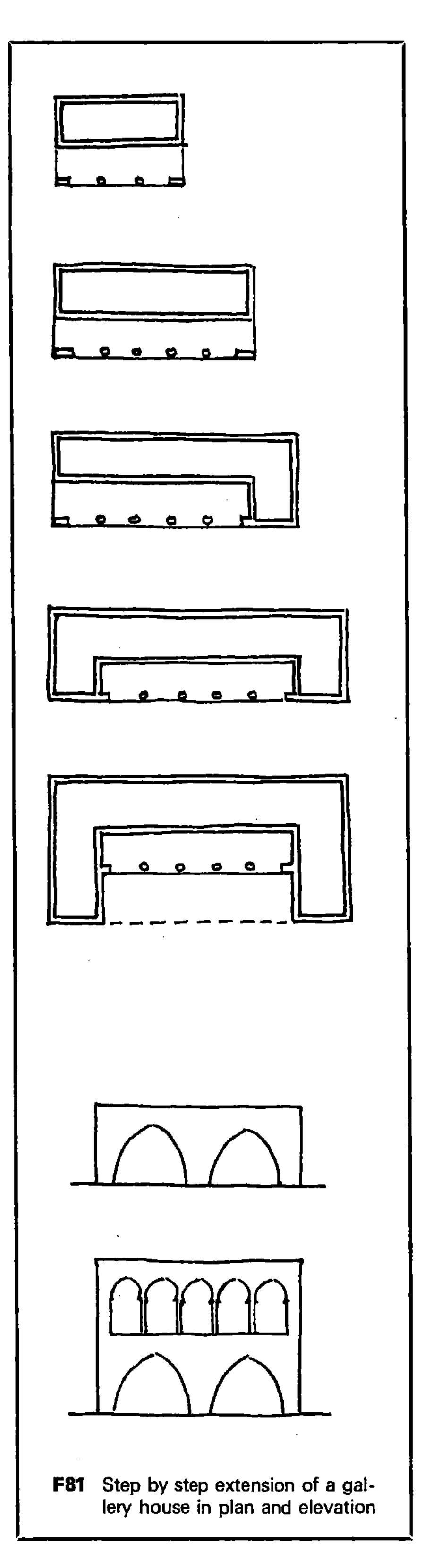
In the simplest case rows of rooms of equal importance are attached to the connecting gallery. There is no distinction between the elements (E14). In contrast to this the U-shaped arrangement of spaces (E16, E17) creates a clear definition of central, right and left parts. This allows within one level the separation of the guests' wing (*maḍāfa*) from the family's wing (*maskan*), or among Moslems the separation of *salamlik* (men's quarters) from the *ḥarīm* (women's quarters). In the predominantly two-floor construction of Lebanon the separation of service areas from living areas is achieved vertically.

The reception and guest areas are best placed near the entrance and opposite to the family area. It is customary for the guest area to have its own direct access and not to lead to other rooms, but it should at the same time be accessible from the family quarters (E16, E17, E22, E24). If there are several living floors, the guests are generally given the top floor (E18).

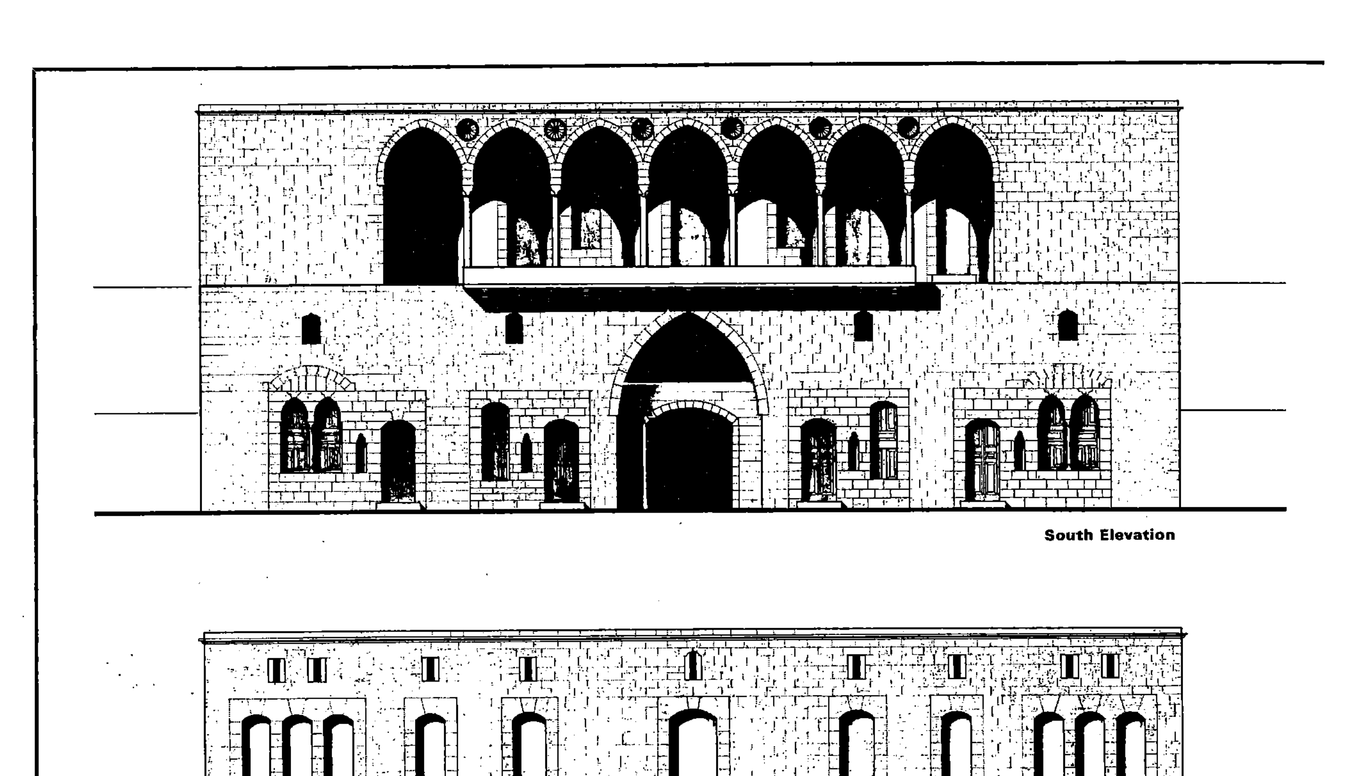
At the same time there is an attempt to emphasize the relation between house and nature, to stress the view of the valley or the garden (E29). The main room is given an increasingly central position and as the design becomes more formal, symmetrical arrangements are preferred. This often conflicts with functional considerations, and in houses like E21, E23, E25, E30 and E31 there is no clear distinction between guests' and family quarters. As a matter of fact, it would seem that the strict separation of men's and women's quarters, as practised in truly Islamic countries, was never observed in Lebanon. This was probably due to the influence of the Christian and Druze elements in the population.

As the plan of the house develops, the elaborate interior designs are abandoned; instead of specific built-in furniture to serve the varied functions of large multi-purpose spaces, such functions are now assigned to individual rooms or floors. Still, kitchens and sanitary rooms are very rarely found within a dwelling unit. They are usually incorporated in the service area or are out in the open. In the city house of the late nineteenth century such facilities are combined in attached annexes (E32, E33).

The Lebanese are very skillful in piecemeal construction of houses. From the start they plan ahead for later additions. This derives not so much from the clan structure of the family as from the anticipation of economic betterment. Gulick underlines the predominance of the nuclear or conjugal family in the Christian village of Munsif,[17] but he admits that the Muslims sometimes live in extended families. In this case the house is subdivided, or extended, or a floor is added for the family of the son. Whatever the reason for a step by step extension, the gallery house proves to be very well suited for it (F81).

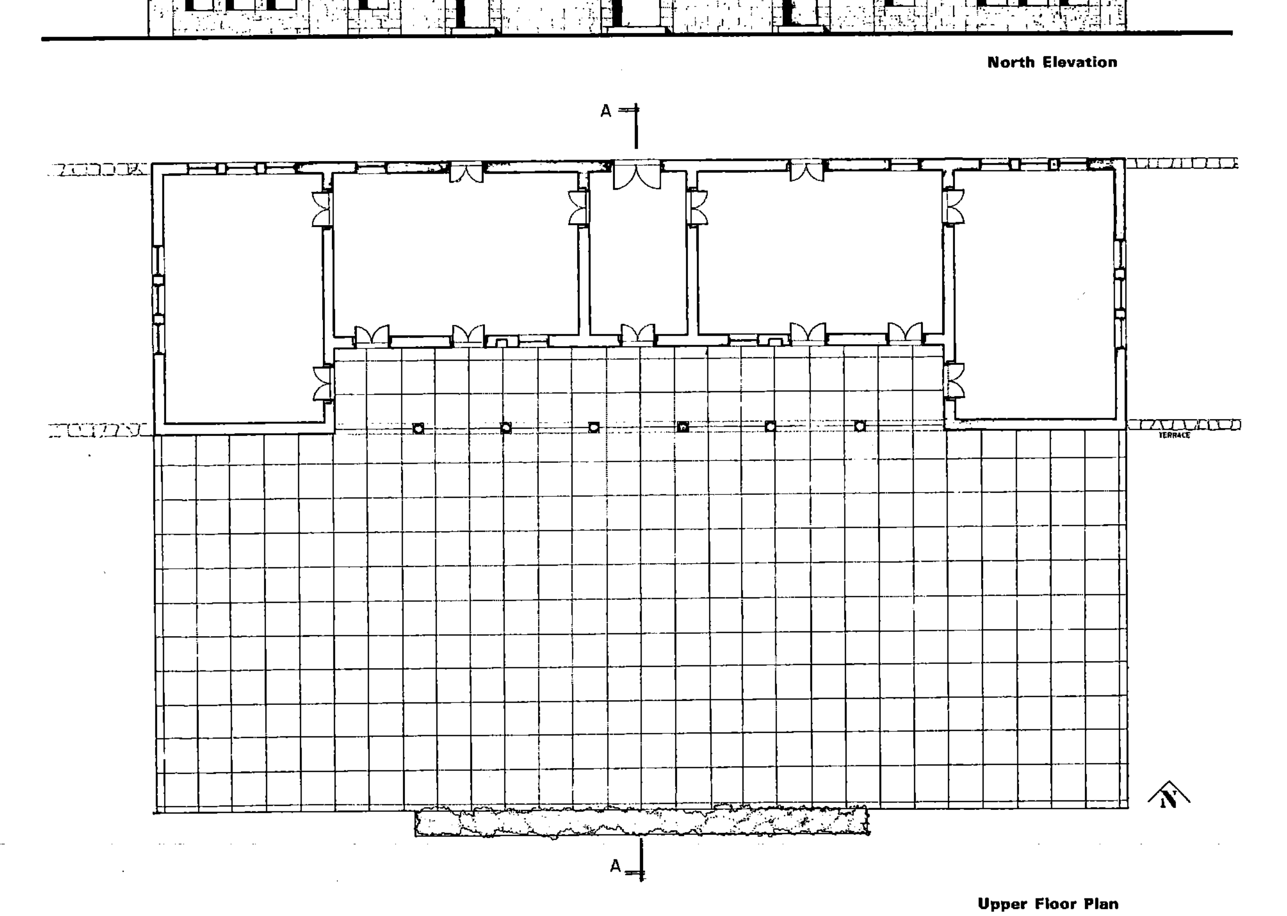


F81 Step by step extension of a gallery house in plan and elevation

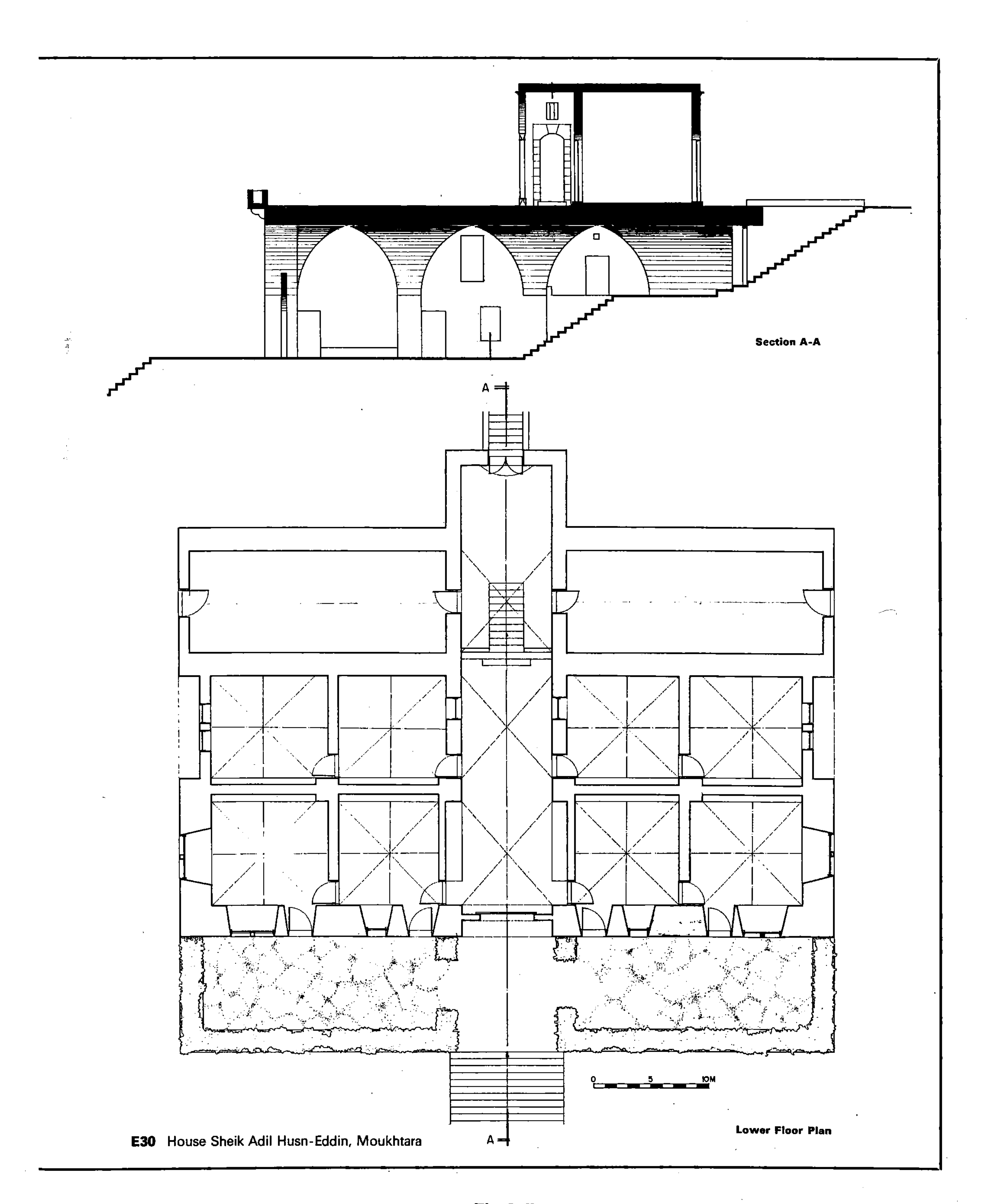


South Elevation

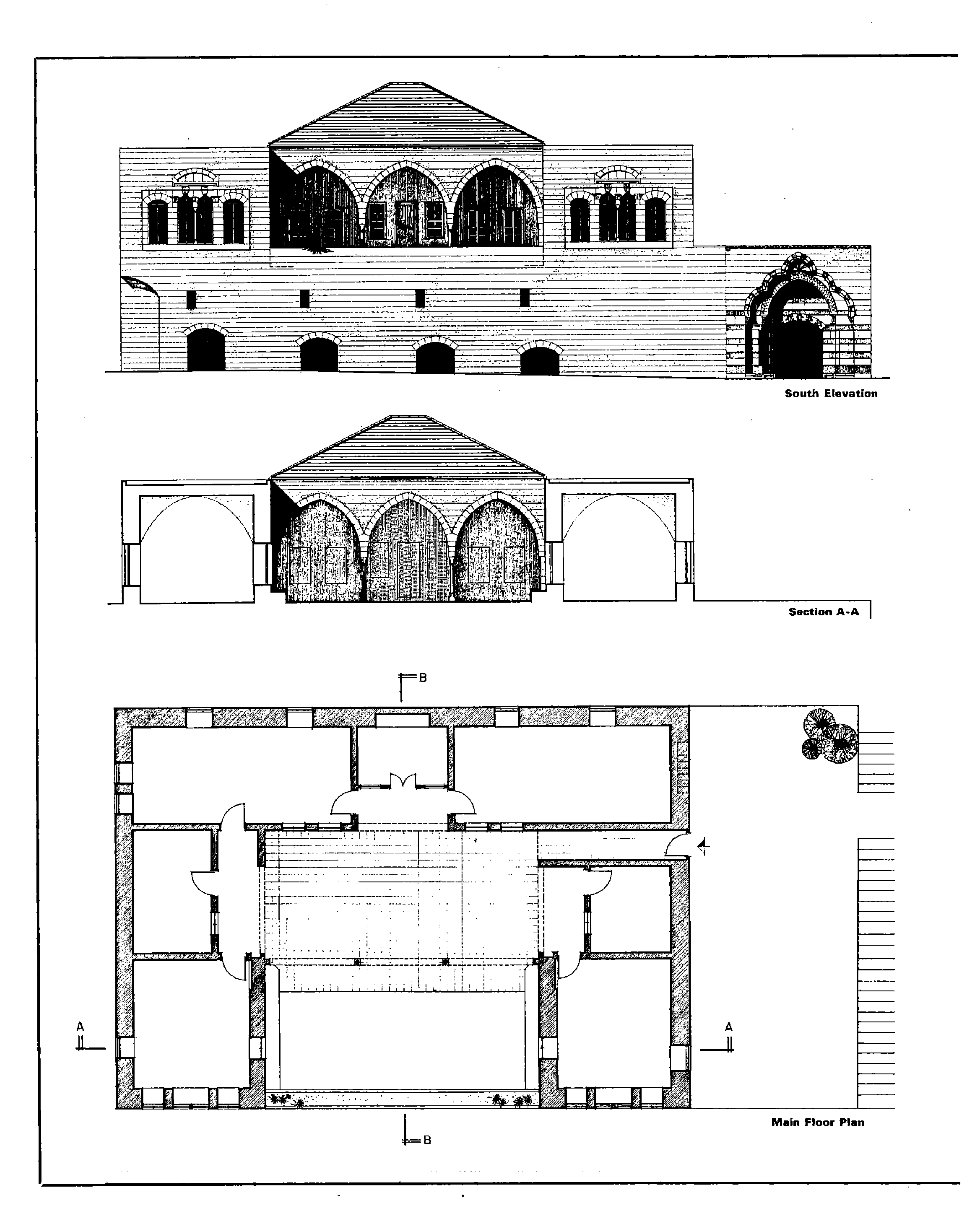
North Elevation

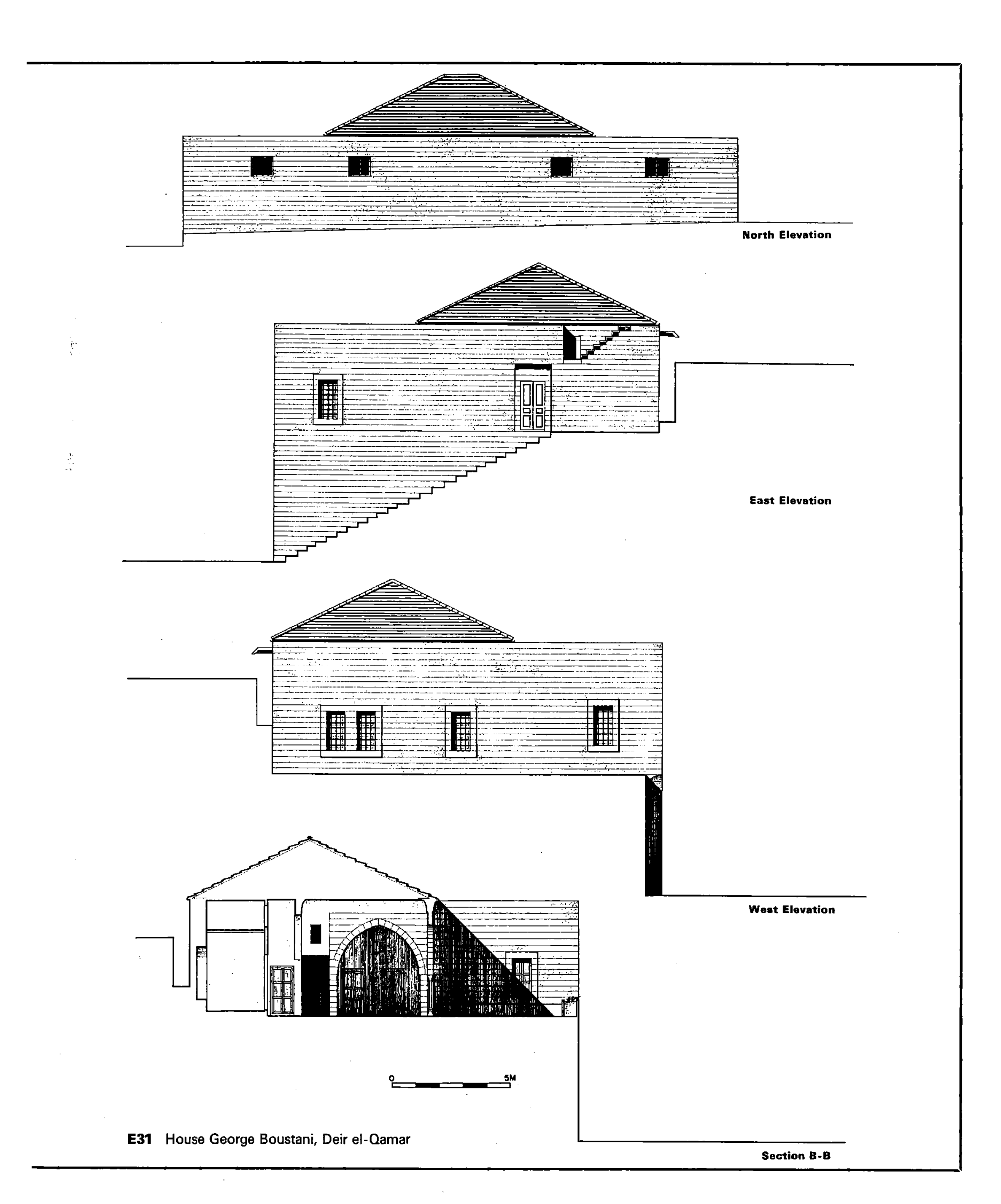


Upper Floor Plan

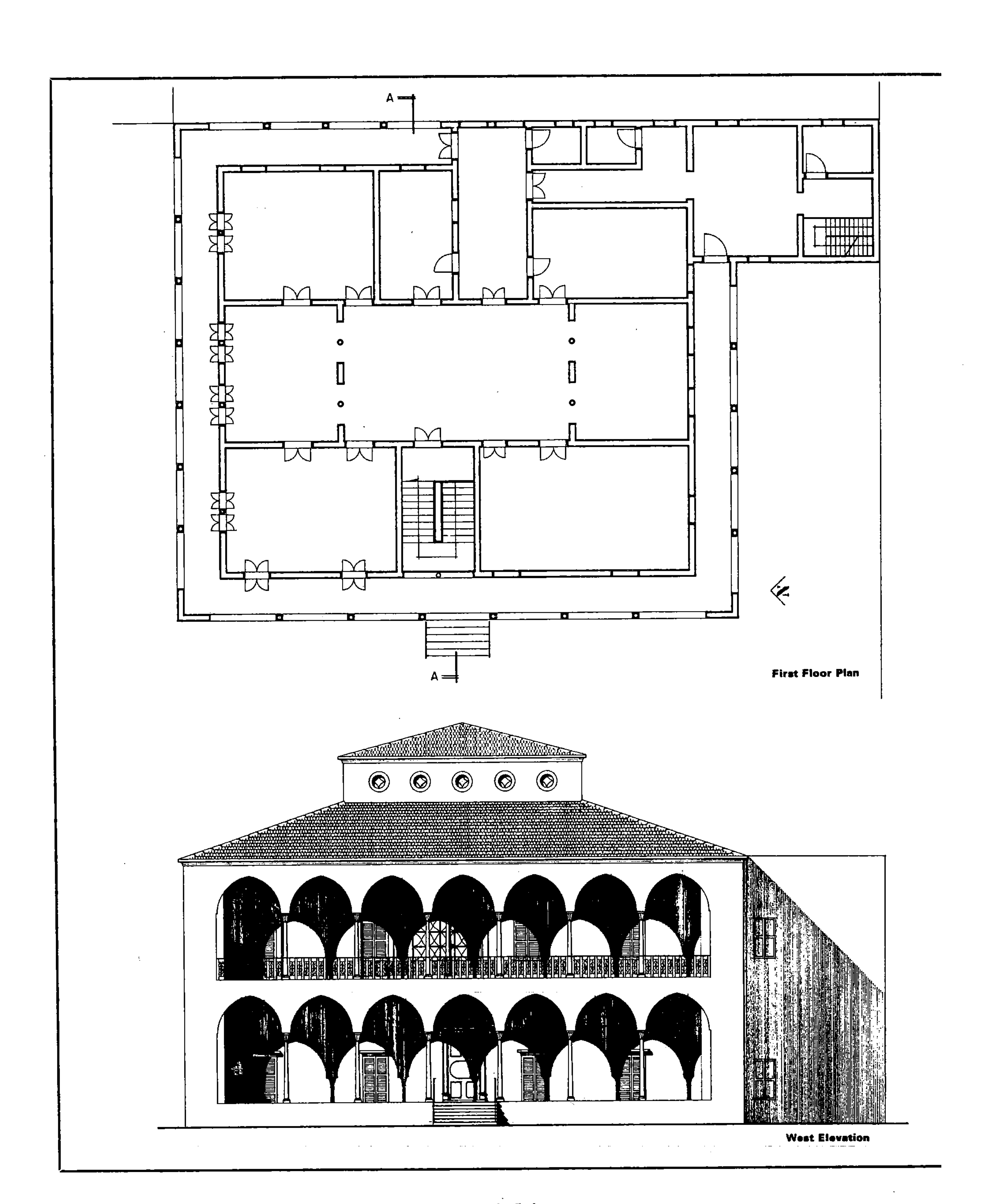


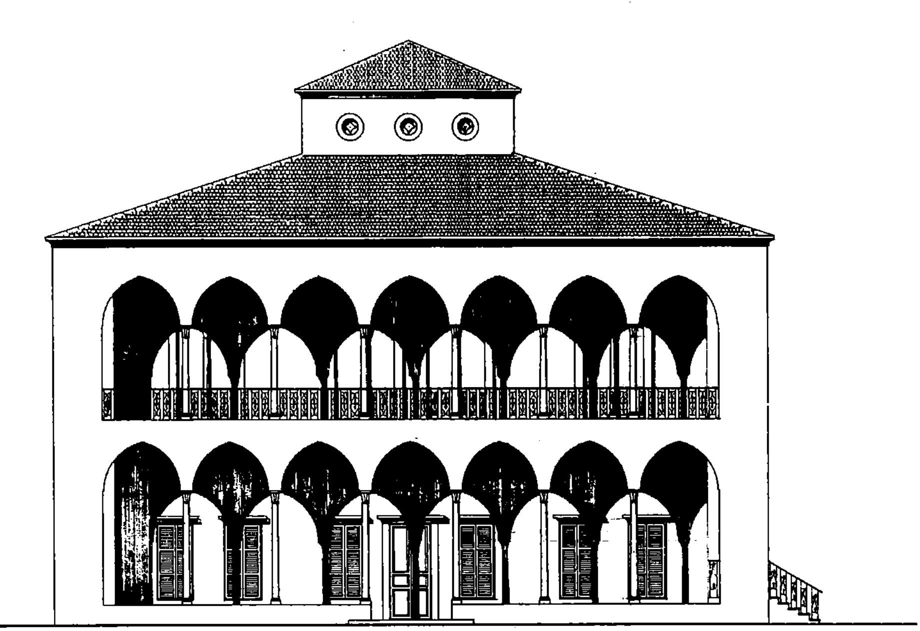
E30 House Sheik Adil Husn-Eddin, Moukhtara


South Elevation
Section A-A
B
A
A
B
Main Floor Plan

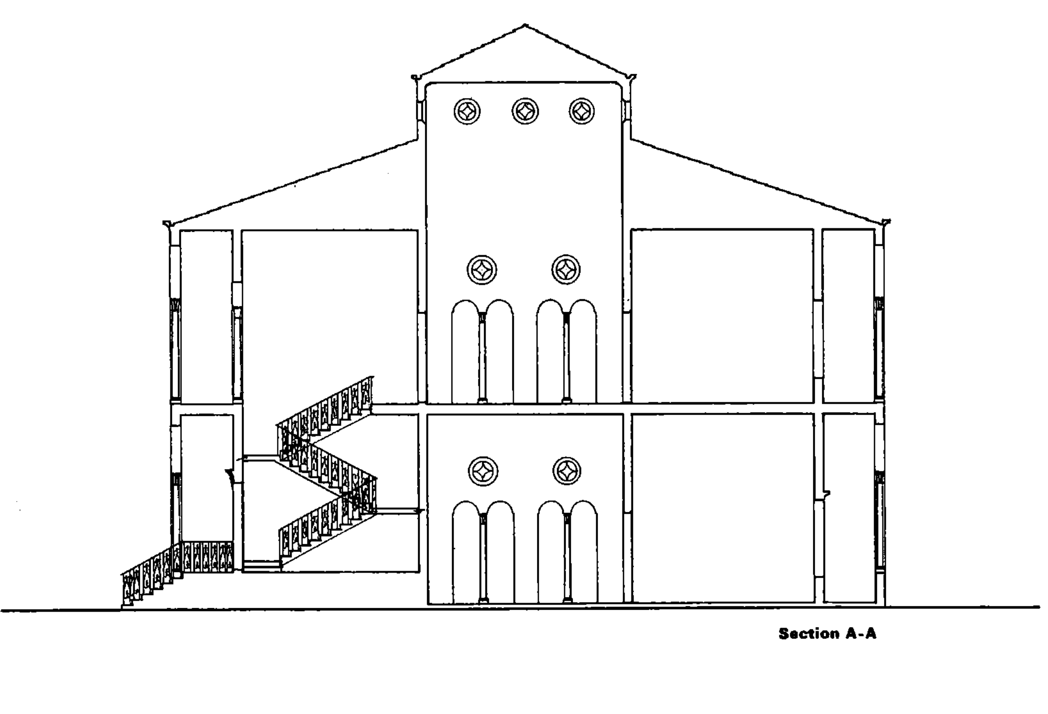


E31 House George Boustani, Deir el-Qamar


A
A
First Floor Plan
West Elevation



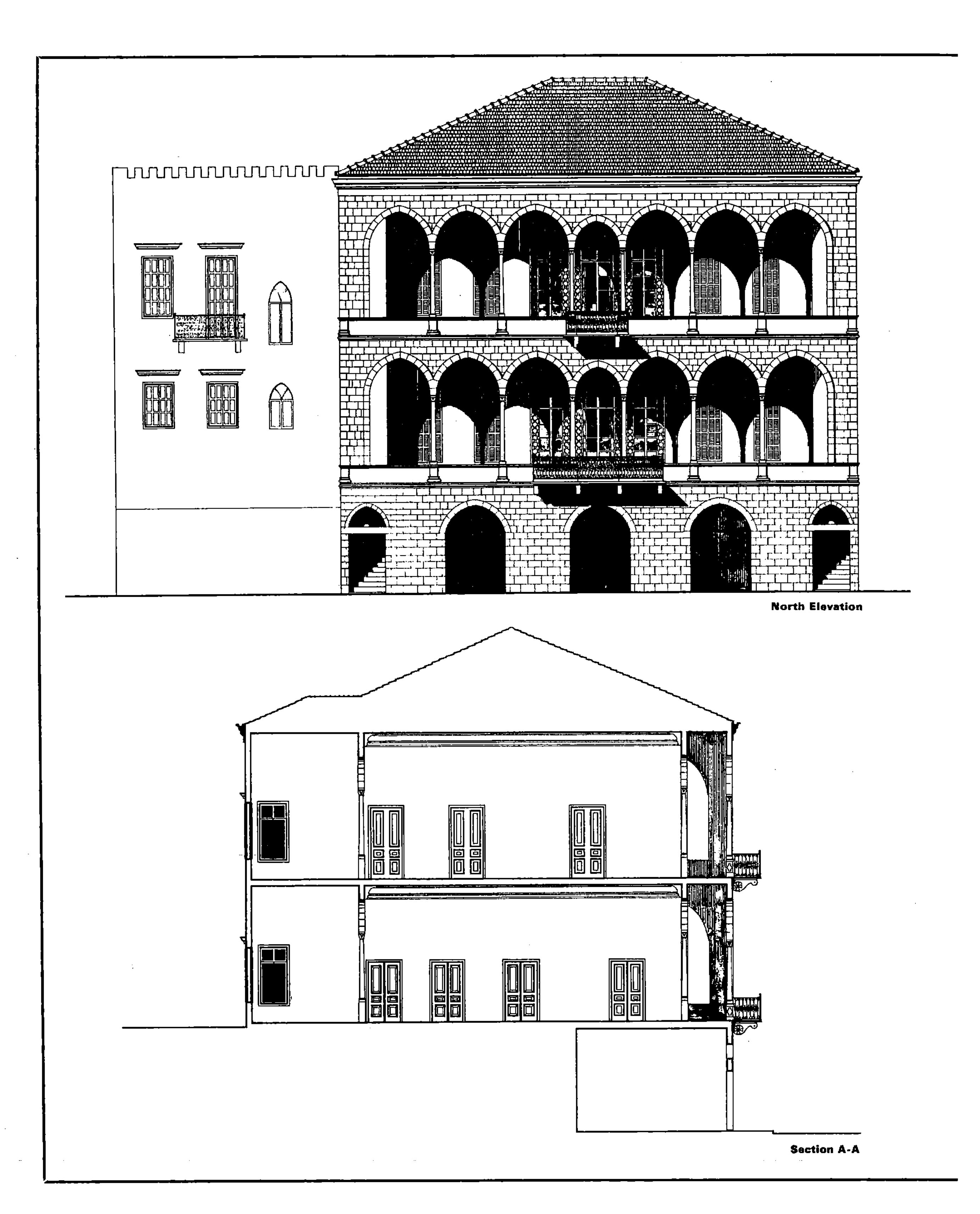
North Elevation

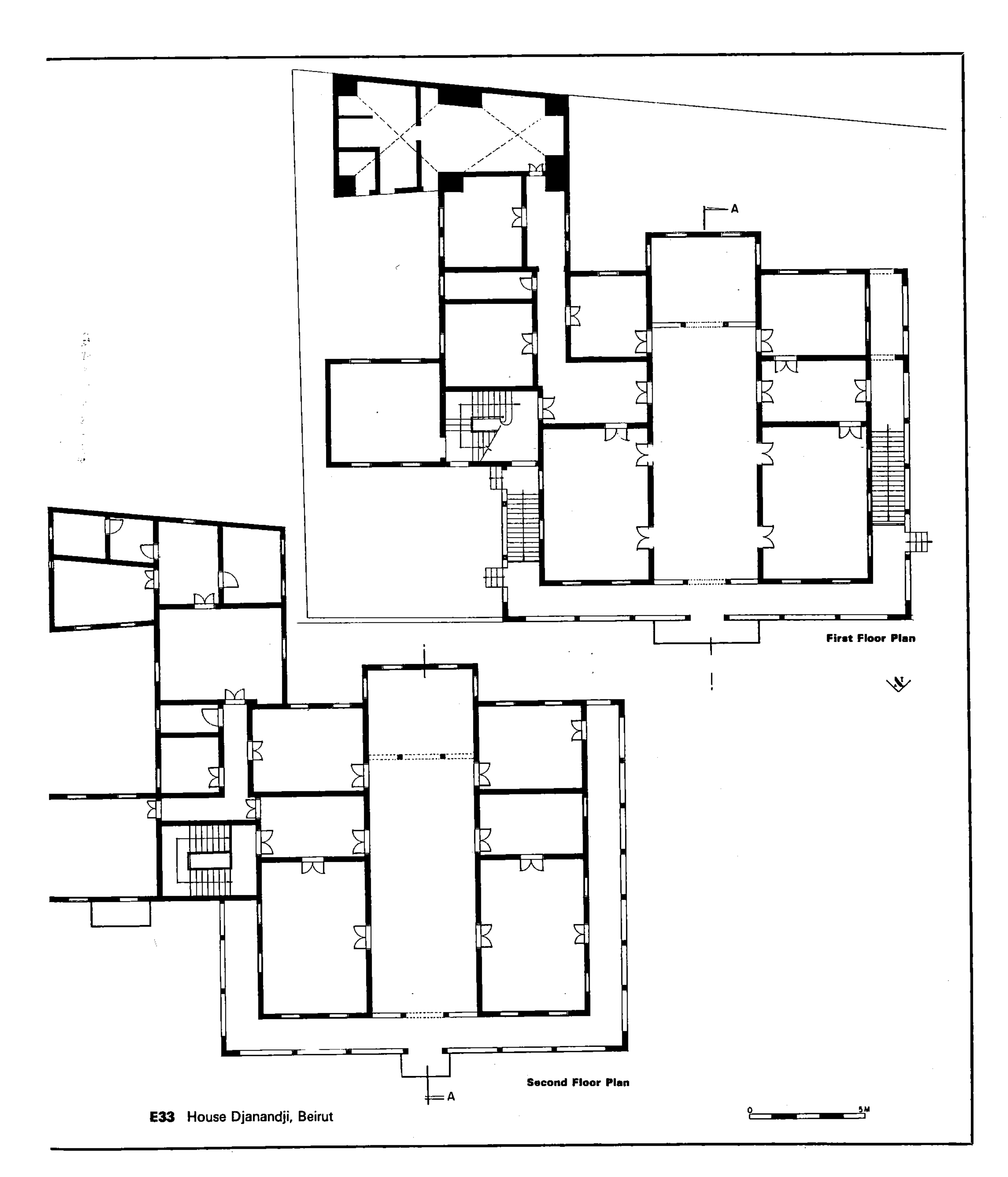


Section A-A

E32 House of the Dutch Ambassador, Beirut

0 5M


North Elevation
Section A-A



E33 House Djanandji, Beirut

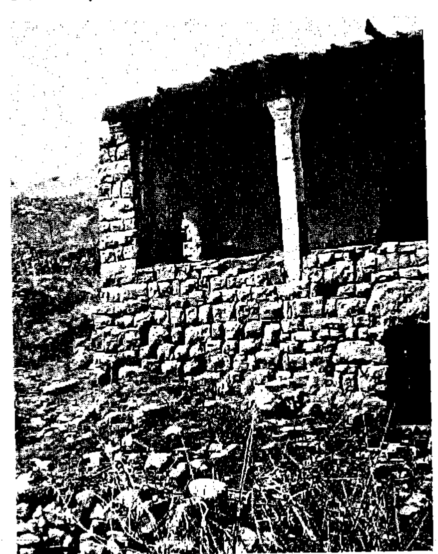
B. CONSTRUCTION



F82 Qnat



F83 Aqora



F84 Mghaira

IN ACCORDANCE WITH the structural evolution of the Lebanese house the gallery first appears as the continuation of the earthen roof on a timber ceiling, supported at the end by a row of wooden posts (E11, upper floor, F82, F83). The next steps are stone pillars (E11 ground floor, F84) and finally an arcade (E12). The arcade is usually composed of pointed arches and built of smoothly faced masonry. In the case of a flat beam roof the arches rest on slender columns, which are 2 to 3 m. long and are rarely more than 20 cm. in diameter. At both ends of the arcade buttressing piers are necessary, these can be as little as 60 cm. in width, because of the sharp angles of the arches (E14, E18, E19, E20, E23, E24, F85). The span of the arches varies from 1,20 m. (E28) to 3,80 m. (E26), but is usually about 2,50 m. As a rule the gallery height is the same as the height of the rooms, which is between 4 and 5 meters.

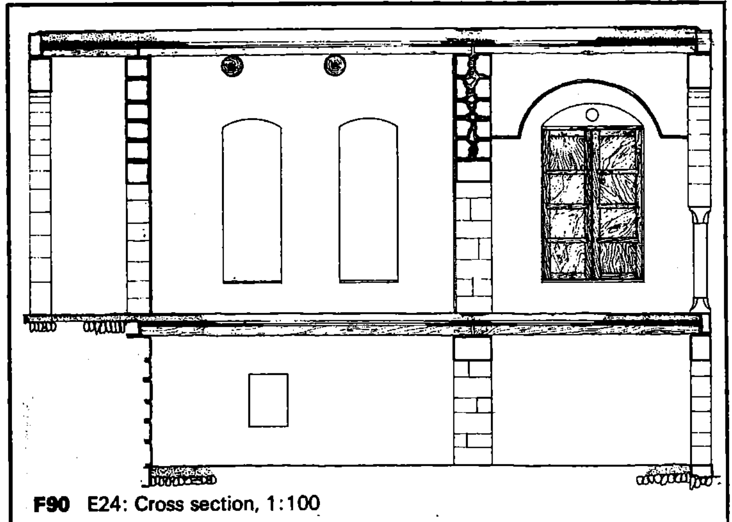
In the majority of cases the gallery house consists of two floors, the lower of which is vaulted and the upper one flat-roofed. There is always a gallery on the top floor, sometimes also on the ground floor (E22, E32), or on an intermediate floor (E33).

To obtain the top floor gallery the arcade generally continues in the plane of the facade below, and the rooms are set back. However, there are cases where the gallery is constructed as a projecting balcony. This may be done by a simple timber construction (F86), or as simulated arcading (F87). Since the corbel construction of the balcony cannot support a stone arcade, builders sometimes resort to a *trompe l'œil* representation, where extremely slender columns carry an arcade made of woodlath and plaster. Fortunately, such contraptions are very rare.

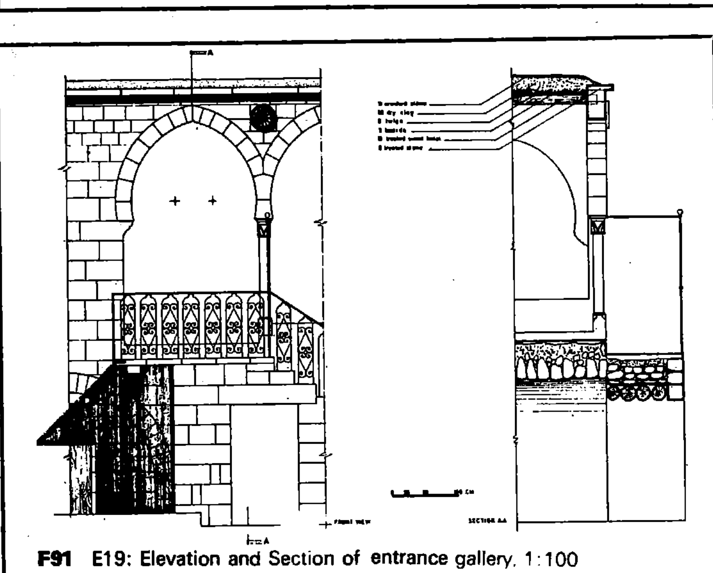
Among gallery houses there are several examples with tiled roofs (E14, E20, E23, E26, E27, E28, E32, E33). The pitched roof was introduced in the nineteenth century when machine made red roof tiles were first imported from Marseilles. There is no trace of the traditional Mediterranean mission tiles in Lebanon. Industrial tiles require an accurate timber substructure for which cut timber must also be imported.

Sometimes tiled roofs were built on top of flat earth roofs in order to eliminate the need of constant maintenance. Sometimes new additions or important parts of the house receive a tiled roof (E31). It is never built above vaulted ceilings, since their solidity ensures that they are water-proof.

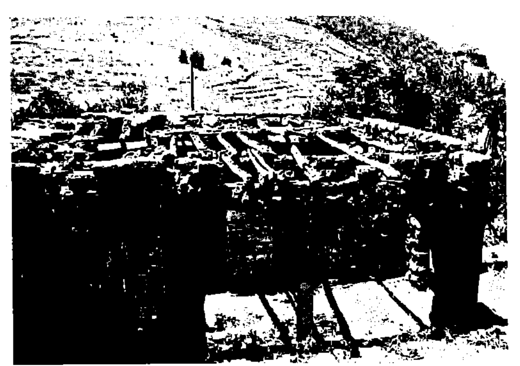
In buildings designed for tiled roofs from the start, the use of roof trusses eliminates the need for internal posts (such as are necessary in E21). The external walls and the partition walls provide sufficient support. Nonbearing walls as well as ceilings are often made of woodlath and plaster. This technique is similar to the plastered reed construction



F90 E24: Cross section, 1:100



F91 E19: Elevation and Section of entrance gallery, 1:100



F85 Beit Menzer



F86 Beshmezzine



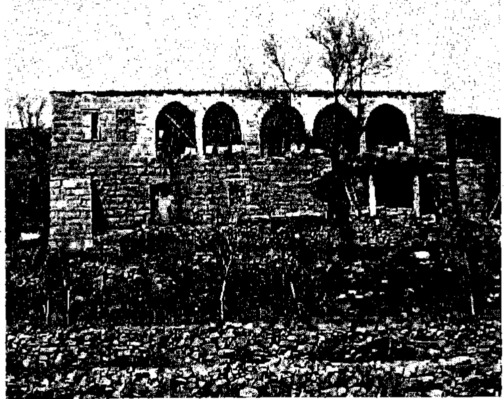
F87 Hasroun


F88 Moukhtara


F89 Detail of tiled roof


F92 Bterram


F93 From E30


F94 House near Qartaba


F95 Niha


F96 Younine

in old farm houses, and is called *baghdādi*, which gives a clear indication of Mesopotamian origin (F88, F89).

With the adoption of tiled roofs the external stairway to the roof top ceases to be useful. Access to the attic — if the ceiling structure is strong enough to be walked on — is by means of a ladder through a trapdoor. Rain water is dispersed by hanging or standing gutters and waterspouts.

Typical construction details are shown in figures F90 and F91. F90 is the cross section through example E24. This house has timber ceilings with earth cover over both floors. The gallery extending the main living space westwards, providing a view to the sea, is complemented by an entrance gallery to the east. The ashlar masonry walls are plastered. F91 gives a detail of E19, the gallery stairs of which rest on a vaulted subfloor. Arch and column details will be discussed in a separate chapter.

Here we should mention the importance of later additions to a given structure. Far-sighted stone masons that they are, the Lebanese very frequently provide impost blocks, projecting tie-stones and arch connections to facilitate later extensions of a building (F92, F93).

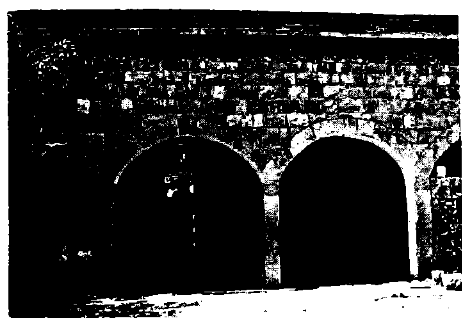


F97 Baadharane

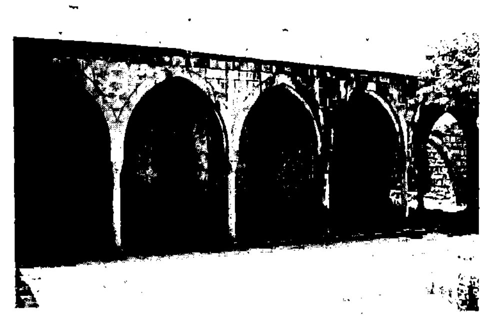
C. EXTERIOR DESIGN

In its formal expression the gallery house presents the greatest possible contrast to the closed rectangular type. With its continuous arcade it gives the impression of total openness while the rectangular type is characterized by forbidding closedness (F94). This contrast is particularly striking in villages (F95). When arcades are used for the gallery, it is as much for decorative effect as for the practical creation of a covered porch, and in more modest villages the well-to-do express in this way their superior social standing (F96).

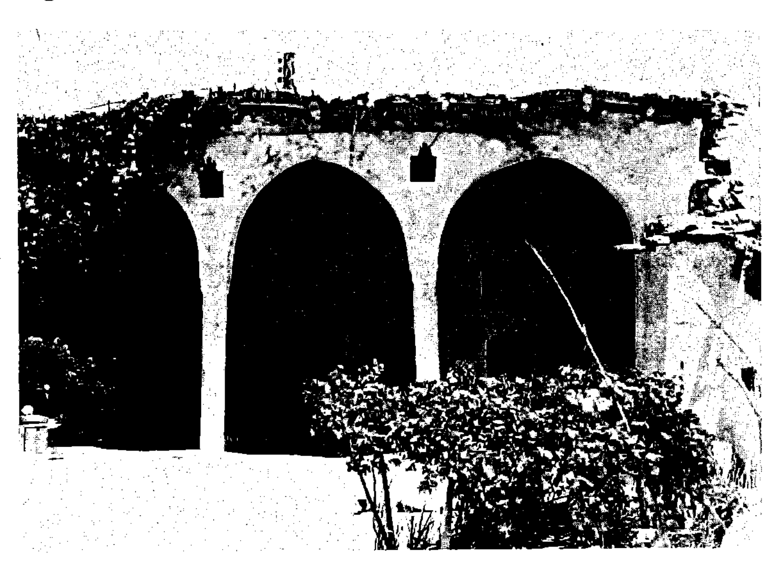
To qualify as a gallery there should be at least two openings. These will define an entrance hall which at the same time serves as a covered porch (F97). Ground floor galleries — with the exception of specific street gālleries — are related to the courtyard or to the garden (E29, F97, F98). In this case the house can be reached either through the courtyard or the garden. The arches are usually pointed, with a slight horseshoe extension (F99); and sometimes there are also low segmental arches (F100).



F100 Dmit el-Berraniye



F99 From E29

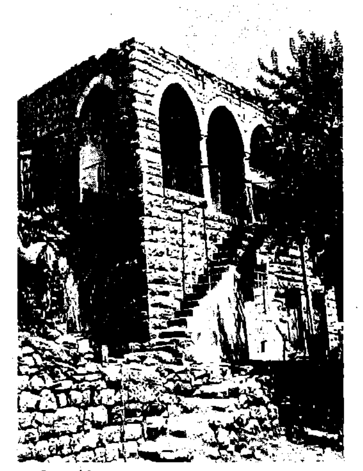


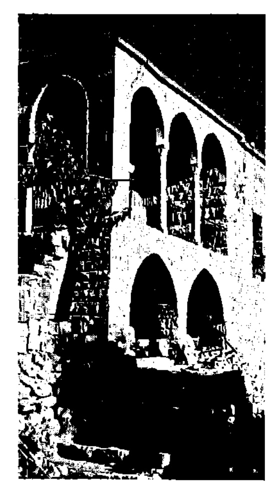
F98 From E12

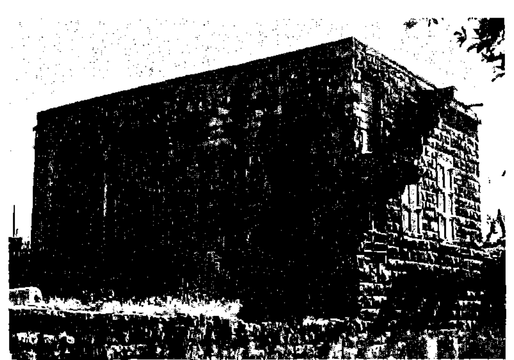


F101 Hasroun

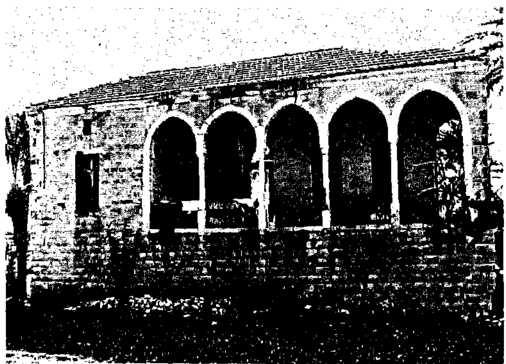

F103 Kadisha valley

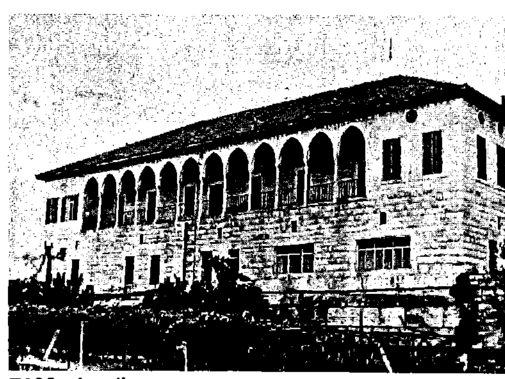

F104 Hasroun

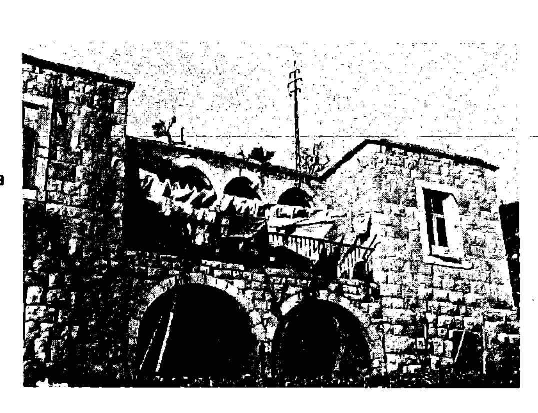

F105 Chourit


F102 Amatour

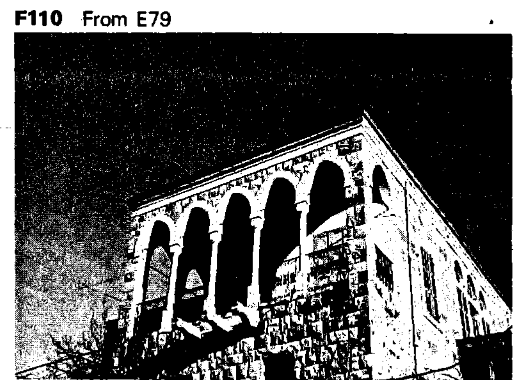

F106 Moat


F107 Aamchit


F108 Antelias


F109 Faraya

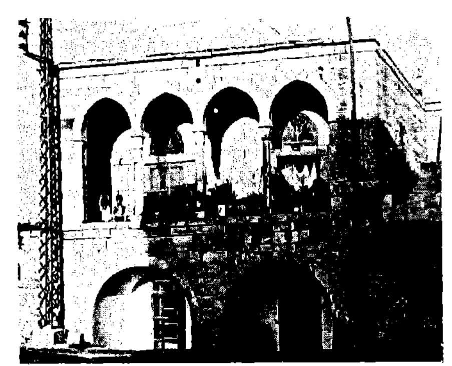
F110 From E79



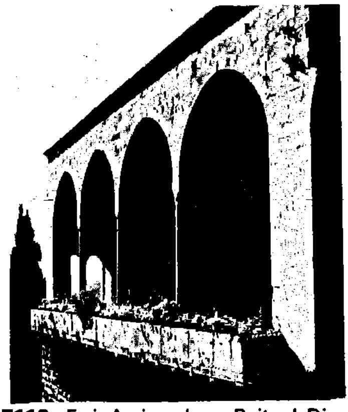
In two-floor constructions the gallery is on the top floor, satisfying the structural logic of mass distribution. From the twin-arched corner gallery with stairway (F101, F102) — on hillsides direct access is often preferred to the view (F103) — the gallery expands to three or more arches (F104, F105), until the whole length of the house is arcaded (F106). The arcade may also continue around corners (E29, F107, F110). There seems to be a slight preference of odd numbers of arches, either three, five or seven (E12, E17, E20, E24, E25, E26, E28, E29, E30, E31, E32, E33), but there are also many houses with even numbers of arches (E14, E15, E16, E18, E19, E21 to E23). Galleries which are adjoined by rooms on the sides are preferably centered in the elevation (E17, E21, E26, E31, F108). If they are placed between projecting wings the symmetry is emphasized, and such houses gain a certain measure of monumentality (E22, E31, F109). On the whole, however, gallery-houses are distinguished by their gracefulness, particularly in lofty positions in the mountains (F110). In many cases the heavy vaults of the lower floor provide a felicitous complement to the slender gallery above (E23, F111). Sometimes the gallery is enriched by decorative arch designs (E29, west, F112) or continuous flower boxes (F113).

The interior wall of the gallery contains the doors and windows of the adjoining rooms. These openings may be quite irregularly arranged, and are augmented by ventilation holes and niches for lamps (F114, F115, F116). The interplay of the various shapes with the sharp shadow of the arcade lends an everchanging life to the gallery elevation.

Example E27 serves as a demonstration of the architectural decadence commencing at the end of the nineteenth century (F117, F118). The proportions of the gallery are weak; the upper floor sits too low in relation to the ground floor vaults;



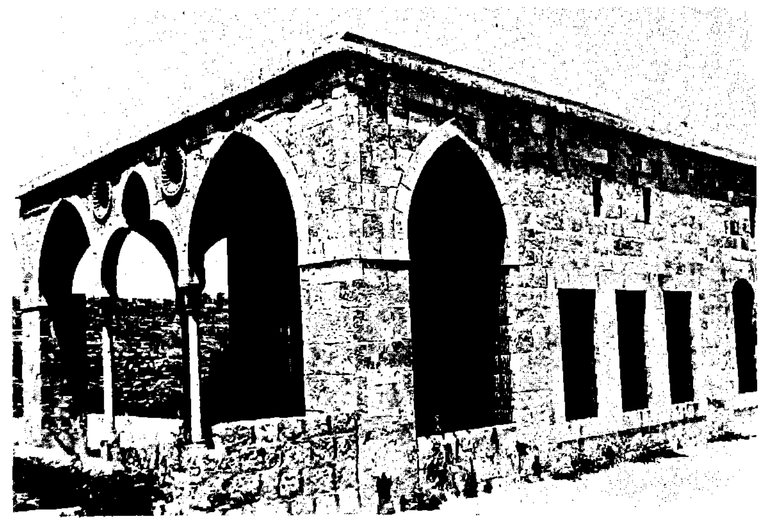
F111 Baaqline



F113 Emir Amin palace, Beit ed-Dine



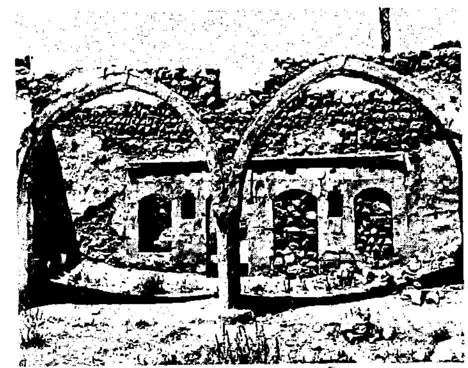
F114 From E12



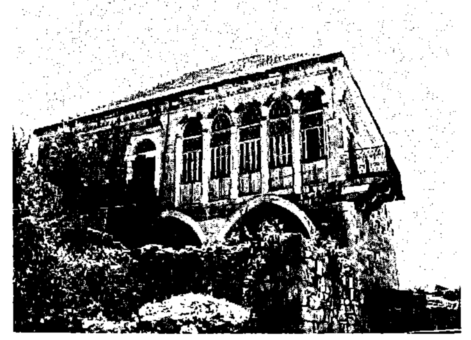
F112 From E29



F115 Detail of F114



F116 Younine



F117 From E28

decoration is overbearing; and the plan is a hybrid. Typical also of the late stage of development are the elaborate glazed patterns of the gallery.

Surprisingly, the advent of tiled roofs did not disturb the architectural tradition. The reason for this is the cubic simplicity of the buildings which marries well with the plain hip roofs (F119). An important factor is the eave detail, which should be very restrained to provide for a smooth geometric meeting between roof and wall (F107, F120). The more obtrusive the cornice, the less satisfactory the transition from wall to roof (F108, F117, F121).

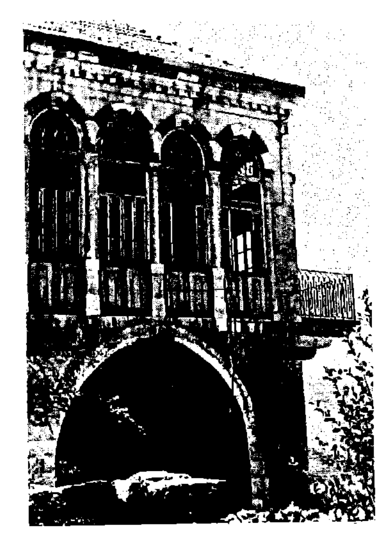
The application of the gallery along streets is surprisingly rare in Lebanon. We find it sometimes in villages where shops or coffee-houses were planned for from the outset. In contrast to other Mediterranean countries, and probably because of Muslim influence, open shopping streets and the custom of promenading in public have not been adopted. Business activities are to this day conducted by preference in the souks, special quarters which derive from the closed khan. Examples are shown in F122, F123 and F124.

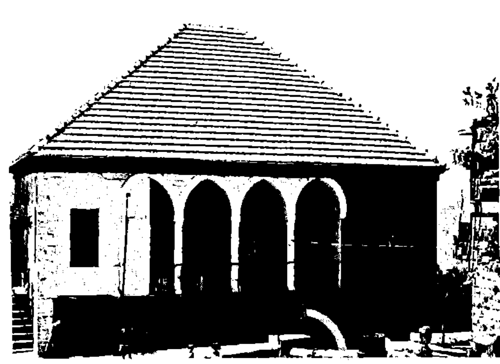
E15 is one of the few buildings, apart from the caravanserail, which were built specifically for trading. The cross-vaulted loggia lends it the character of a public building, dominating the town square of Bterram, where it still serves as a shop (F125, F126). In this connection it is important to stress the social function of the store as a meeting place for men.[18]

The gallery-lined buildings of the city must be looked at independently (E32, E33). Distinctive in appearance, and well suited to the climate, they are a logical application of the gallery in towns. The abutments at the corners frame the mass of the building and terminate the movement of the gallery arcades. In example E33 the small middle arches are unusual. In combination with the balconies they define the position of the central hall, and add an interesting rhythm to the elevation.

D. INTERIOR DESIGN

As a general rule we can say that, with increasing emphasis on the external appearance of the building and the multiplication of internal subdivisions, the continuity and articulation of internal space is reduced. The volume of the house is split up into cells of 10 to 15 m² in area, and the main function of the gallery is to act as a connecting element. This development stems from economic improvement, along with the desire for greater privacy. Its disadvantage lies in the loss of a clearly defined central living area for the whole family, a feature essential to the traditional life pattern. This unfortunate arrangement is particularly obvious in the linear suc-





F119 Hasroun



F118 From E28



F120 From E60



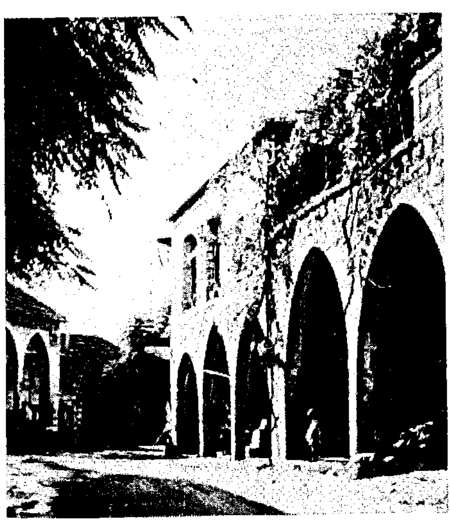
F121 Hasroun





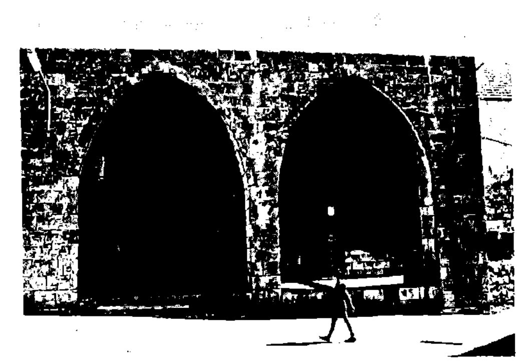
F122 Hasroun

F123 Deir el-Qamar





F124 Maameltein



F125 From E15



F126 From E15

cession of rooms (E14), as well as in the strictly symmetrical solutions which do not allow a dominating space, except for the gallery or the terrace (E30, E31).

With the vertical separation of service and living area in two-floor construction, the attractive variations of floor levels within one space are also eliminated. Built-in cupboards and niches, however, are still in evidence.

An improvement in design is made—as seen from inside — when the gallery provides an extension of the interior space, and takes full advantage of climate and landscape. In small houses the double function of the gallery as traffic and living-area is acceptable, and the visual effect of the gallery, the depth given to the view, satisfies in all cases.

Finally, the extension of projecting wings delimits an additional open space which may be used as a terrace. We notice here certain similarities to the court house concept (E31). The interiors of examples 32 and 33 correspond to the central hall scheme and will be discussed later.

E. ORIGIN

It is instructive to look at related house forms in neighboring countries before studying the origin of the gallery house. The tarma house in Iraq, described by Reuther[19] and the riwaq house in Syria, described by Sinjab,[20] are similar in principle to the Lebanese gallery house. Figure 127 shows variations of the tarma house as described by Reuther, and F128 shows Sinjab's variations of the riwaq house. Reuther dismisses a similarity between the Iraqi tarma and the Hittite Hilani or the Persian Apadana access, since these are only porches which lead to the entrance proper.[21]

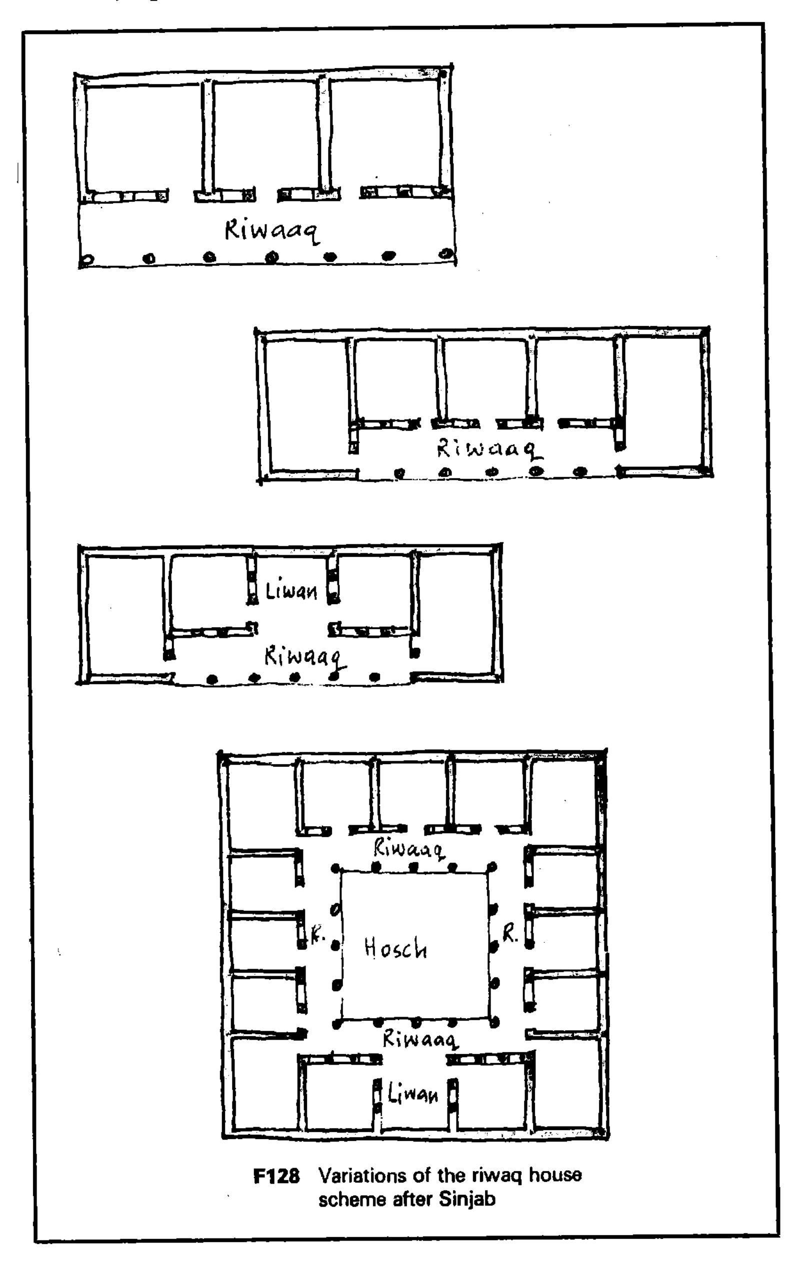
The antique model which fits the gallery house as a colonnade lined by a series of rooms, is the stoa. K. Swoboda[22] derives this type of gallery from the corridor which was used to connect several rooms. He traces the gradual replacement of the wall, first by piers, then by columns, in the architecture of Egypt, Crete and Anatolia.

There are very similar buildings to these found in Northern Syria which date from Byzantine times, as the excellently preserved dead cities extensively reveal. As early as 1904[23] and 1907[24] A.C. Butler studied the Byzantine dwellings. Figures 129-131 show reconstructions published in a more recent work by G. Tchalenko.[25]

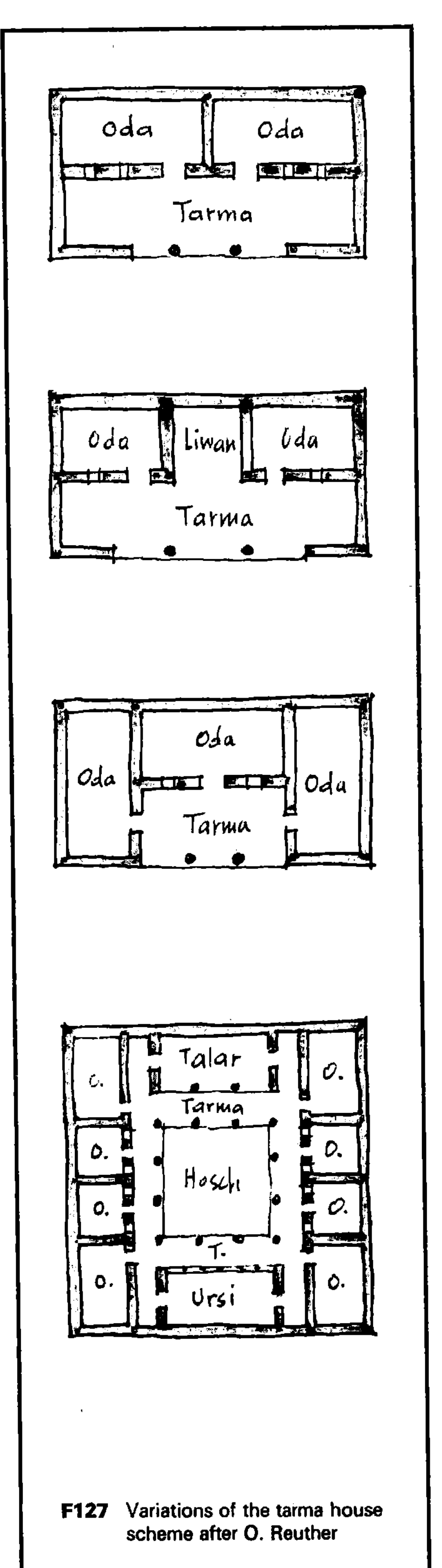
However, there is a basic difference between the Arabic and Byzantine examples presented above, and the prevailing Lebanese type of gallery: all galleries are related to courtyards; the houses are closed to the outside; the gallery does not appear externally.

Since the gallery house constitutes in principle an extension of the closed rectangular house, and can be built with

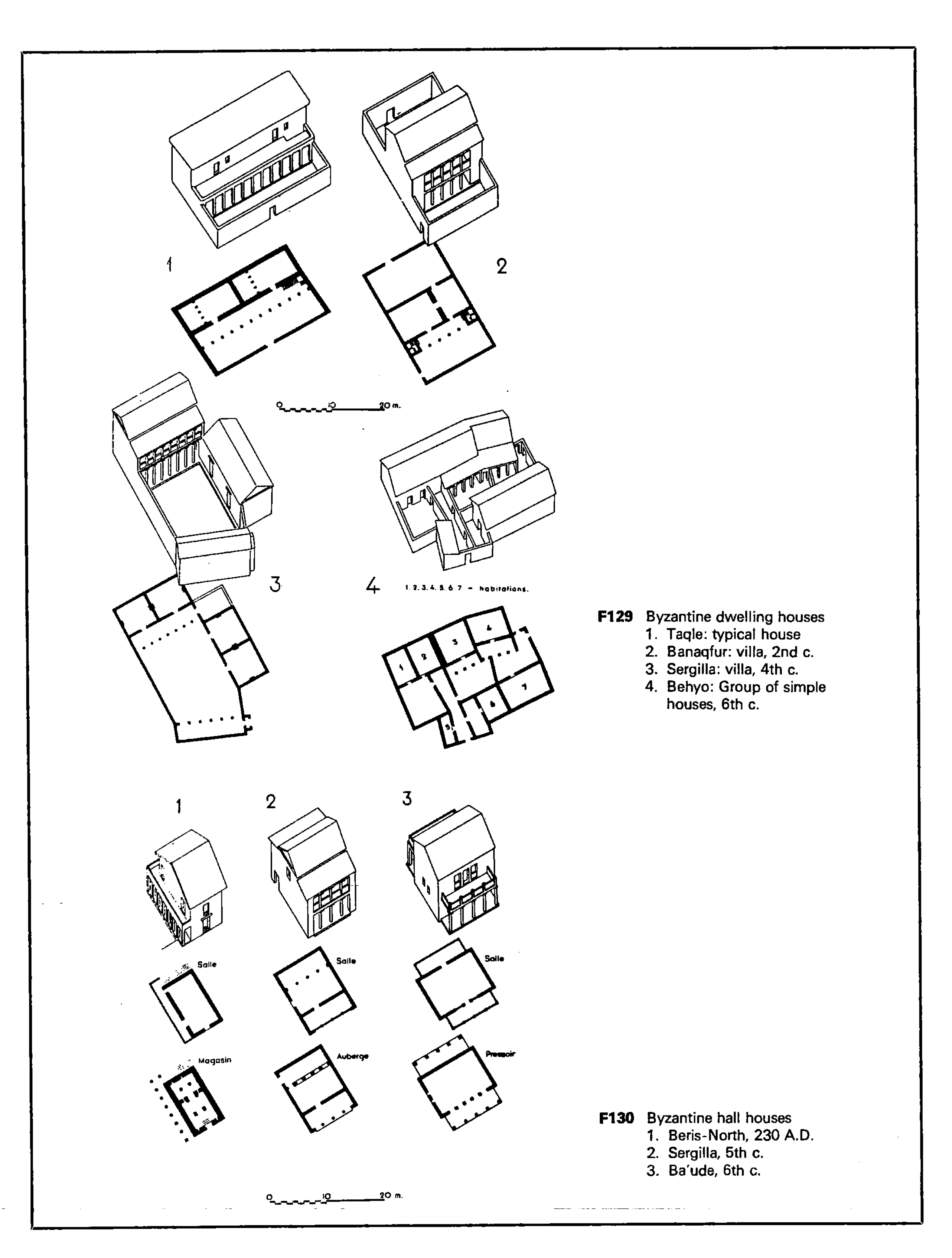
the same technical means, we can assume that both types are equally old. However, galleries are fragile constructions and leave fewer traces than walls. Reconstructions of Hittite dwellings in Kültepe and Boghazköy[26] display striking similarity to existing Lebanese examples (compare F83 with F132 and F133). It is significant that the Hittite examples also originate in a mountainous region, where the secluded court scheme is not suitable. It is precisely this specific condition of mountainous terrain which was responsible for the liberation of the Lebanese house from the introverted court scheme, a phenomenon without parallel in Arab architecture.



F128 Variations of the riwaq house scheme after Sinjab

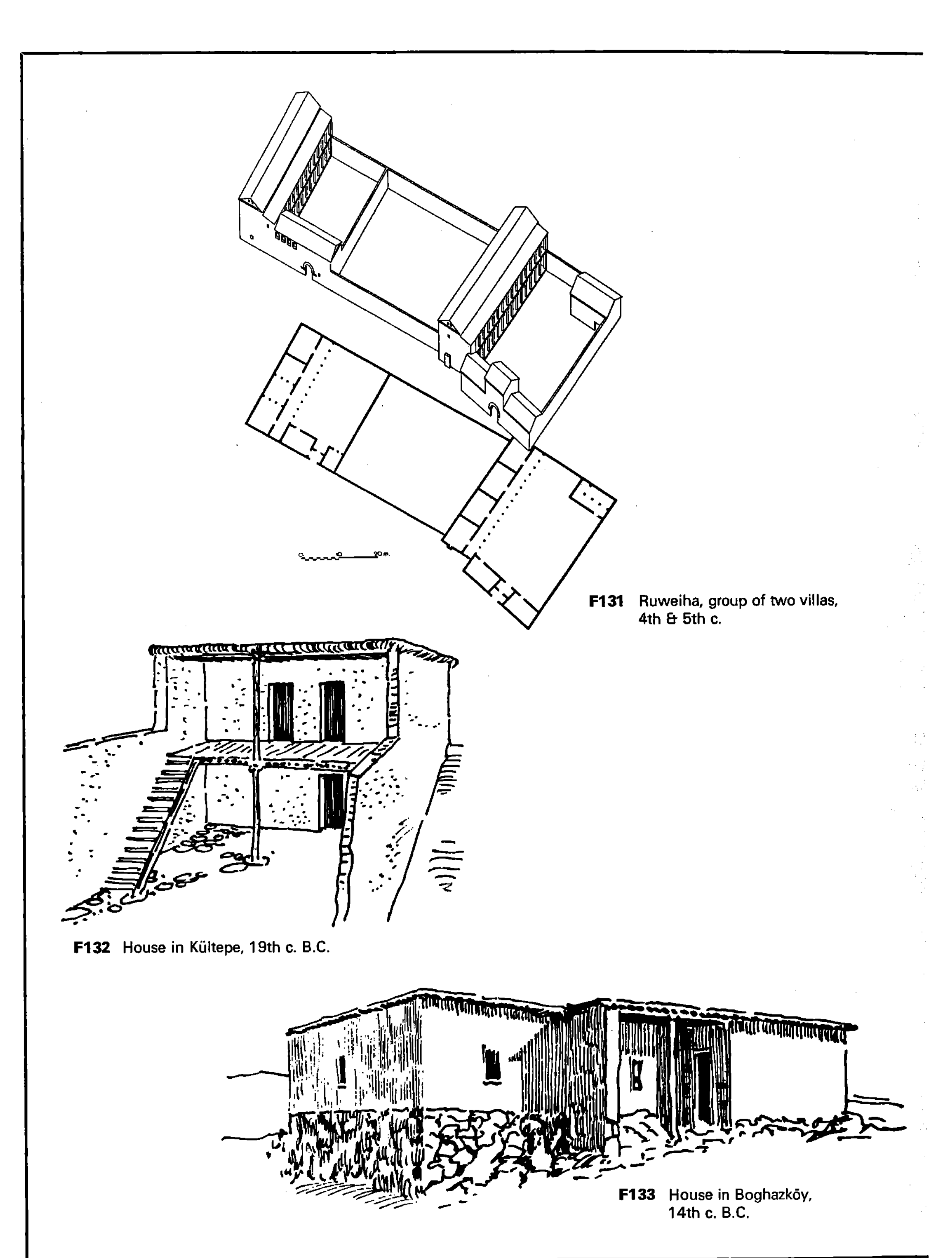


F127 Variations of the tarma house scheme after O. Reuther



F129 Byzantine dwelling houses
1. Taqle: typical house
2. Banaqfur: villa, 2nd c.
3. Sergilla: villa, 4th c.
4. Behyo: Group of simple houses, 6th c.

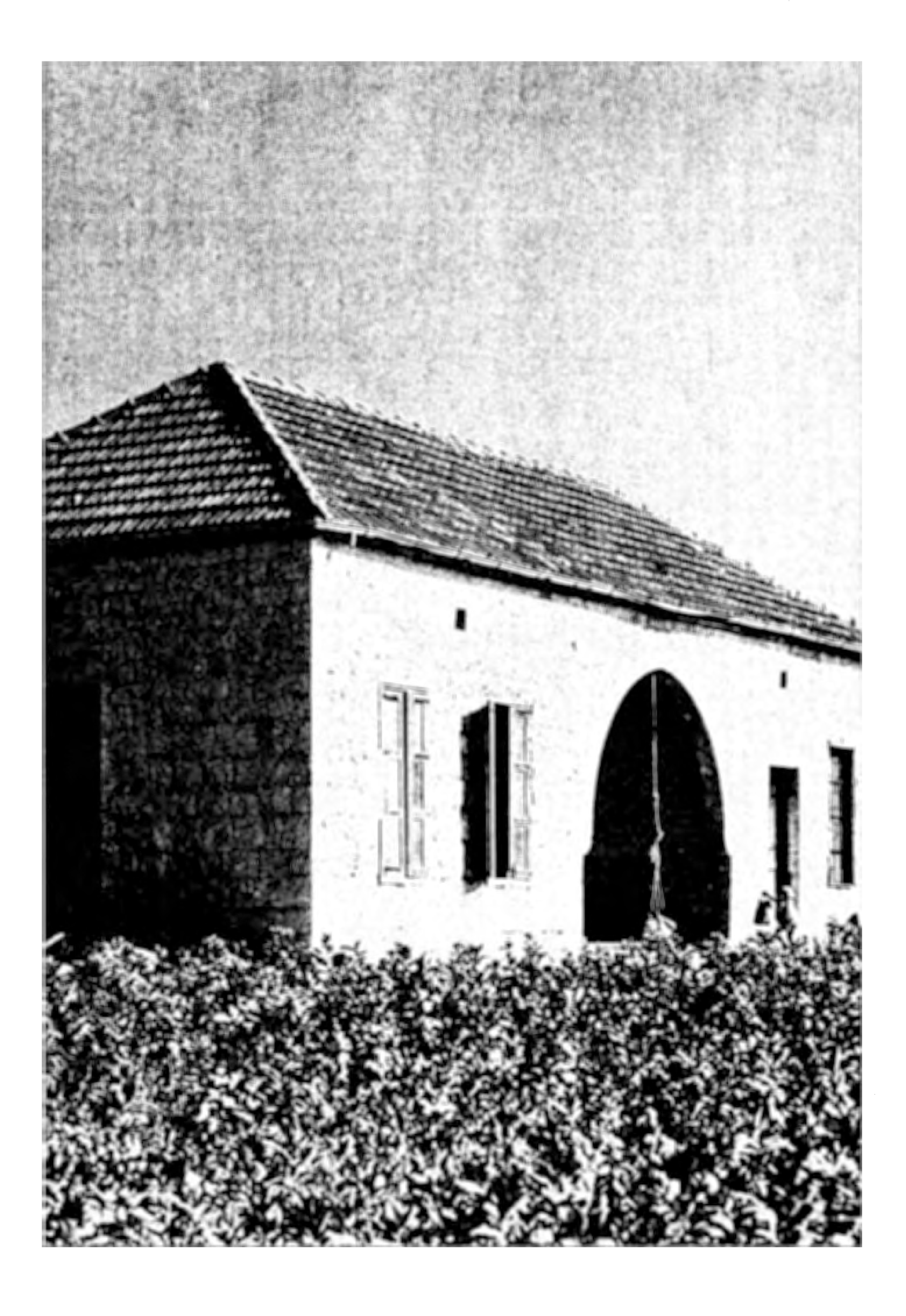
F130 Byzantine hall houses
1. Beris-North, 230 A.D.
2. Sergilla, 5th c.
3. Ba'ude, 6th c.



F131 Ruweiha, group of two villas, 4th & 5th c.

F132 House in Kültepe, 19th c. B.C.

F133 House in Boghazkõy, 14th c. B.C.



3. The Liwan House and Related Court Houses



A. PLAN

AMONG THE FOUR house types of the Lebanon the liwan house is found least frequently. Since the liwan is a space which opens to the outside, it needs a continuation in front of it. The liwan scheme is therefore intimately related to the court house, and both types are discussed in this chapter.

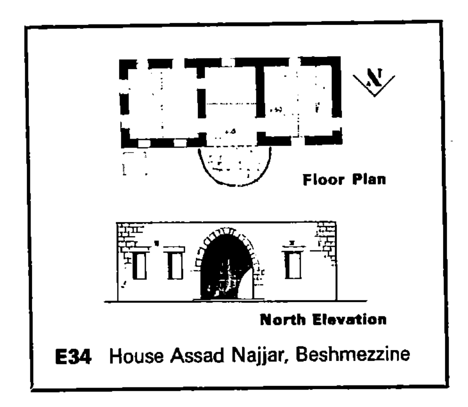
In its simplest form we find the liwan house as a free-standing unit on one of the countless terraces in the mountains. A central space, totally open in front, and called a *līwān,* connects to two closed rooms right and left. The doors to these rooms are always near the front corners of the liwan and the strip connecting the two doors is a circulation zone. The liwan cannot be closed to the outside; it really is just a covered terrace, and its application only makes sense in a warm climate, and when the liwan is protected from wind, dust, animals and people. This necessitates the addition of a courtyard in the coastal plain or, on the hillside, the extension

of a terrace, supported by retaining walls. From now on we shall refer to the combination of a liwan with its two side rooms as a liwan unit.

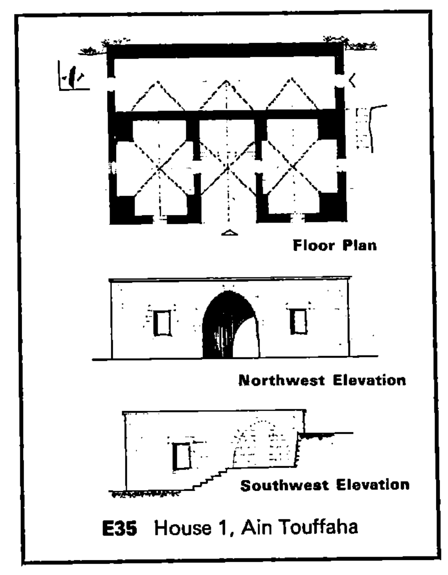
Example 34 shows the simplest arrangement, a liwan, 3 m. wide and 5 m. deep flanked on both sides by rooms, 4×4 m^2. In front of the liwan there is a semi-circular paved area. The house is planned as a finished, detached unit, as demonstrated by the windows placed on all sides. Stables and storage rooms are built separately. Example 35 shows the addition of a service wing uphill at a higher level with its separate entrance, but the liwan is still on the ground level in front. This changes in example 36 where the liwan is above ground level, opening to a sudden drop on the valley side. We see here clearly the effect of the steeply sloping site which is a typically Lebanese situation. Characteristically, a narrow balcony on corbel stones has been added in front of the liwan.

Example 37 introduces the linear extension of a liwan unit by successive rooms following the contours of the land. The originally open liwan was closed (hatched indication), and an open corner vault added as compensation.

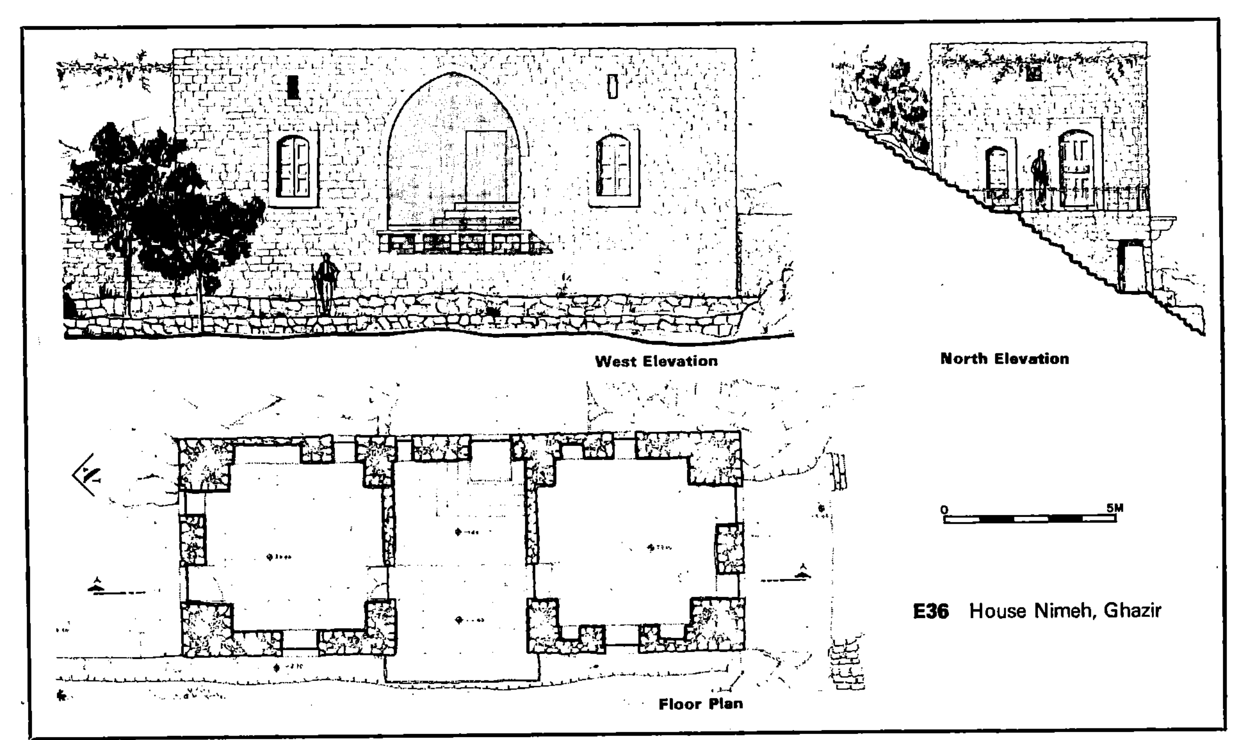
In example 38 we can discern an important development. First, the liwan is on the upper floor, such that the living area is placed on top of the service floor; second, the liwan is turned towards the hill and opens to a terrace. In this instance the rear wall of the liwan is pierced by a window to allow a view down the valley. Both modifications are specifically Lebanese innovations and essentially foreign to the liwan principle.



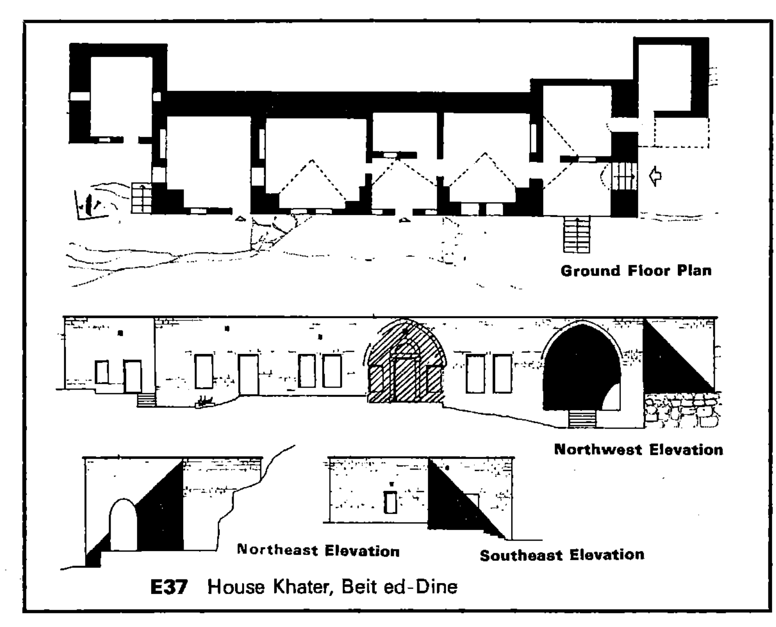
E34 House Assad Najjar, Beshmezzine



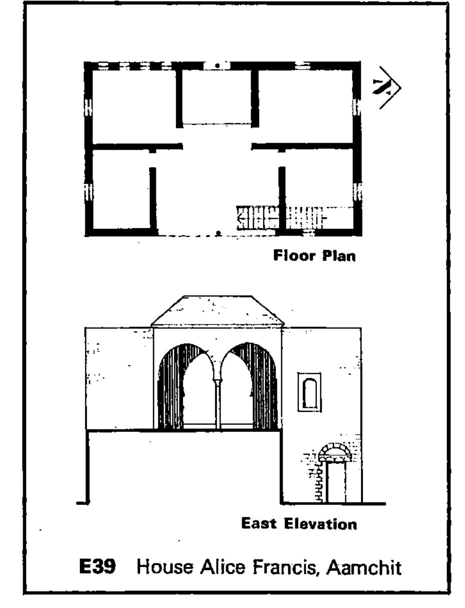
E35 House 1, Ain Touffaha



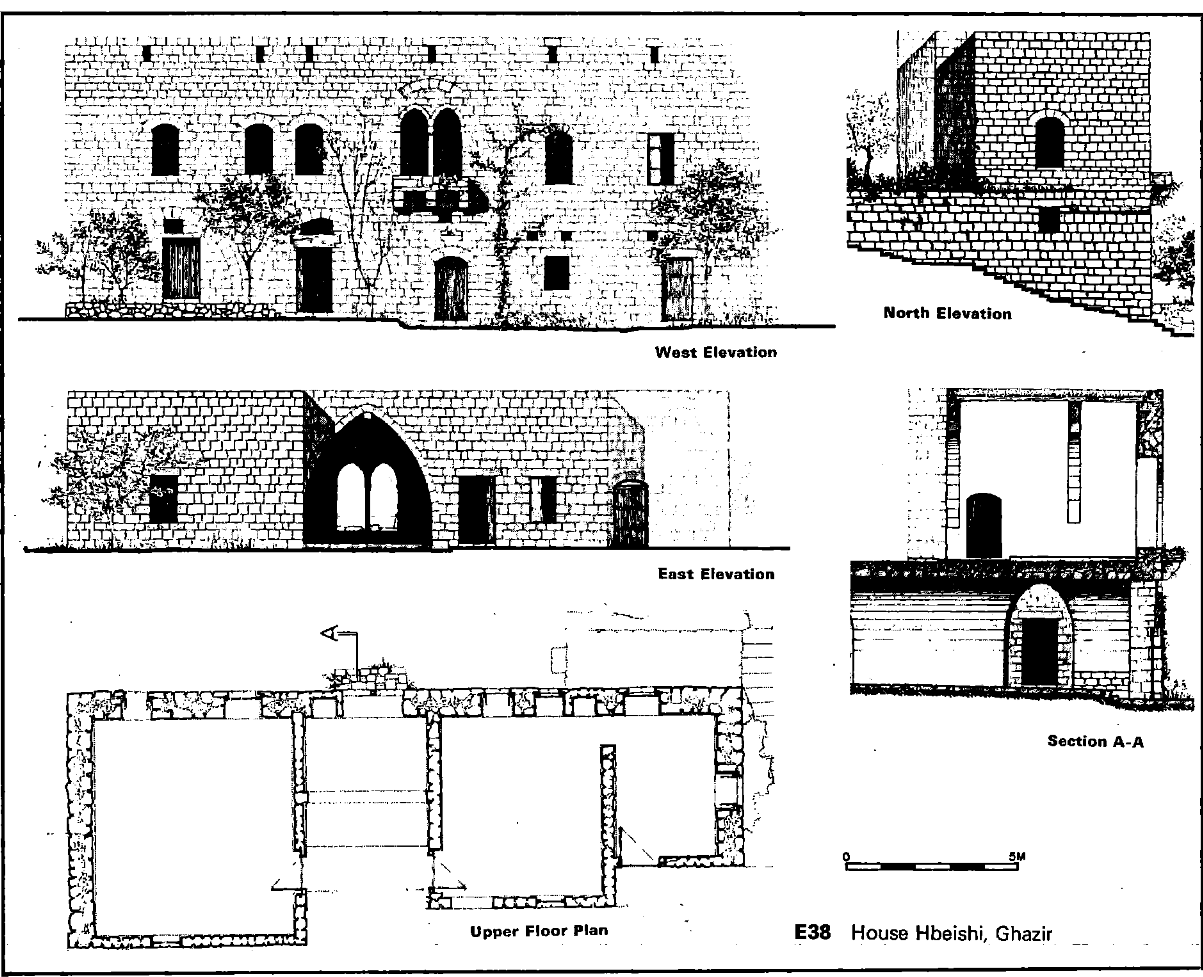
E36 House Nimeh, Ghazir



E37 House Khater, Beit ed-Dine



E39 House Alice Francis, Aamchit



E38 House Hbeishi, Ghazir

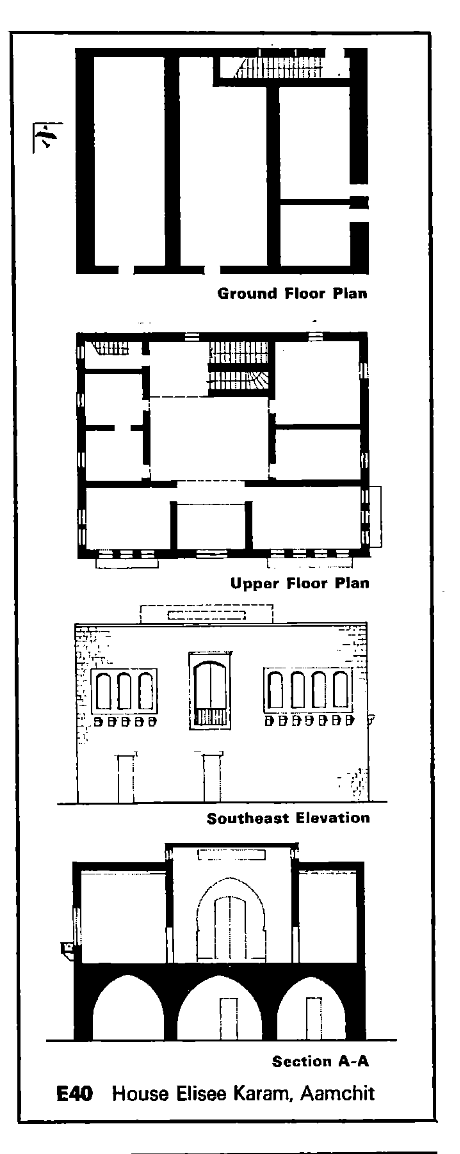
In example 39, two additional rooms are extended like wings from the liwan unit. In this way a hall is created, closed by a double arch opposite to the liwan. In a sense we have a liwan with a gallery, however the internal placement of the stairway is quite foreign to a gallery scheme. Actually, in this instance the house was only half finished and the addition of an enclosing wing to the east was presumably envisaged.

The completion of an internal court is shown in example 40. It resembles an atrium house with liwan unit. The ground floor consists of three pointed vaults above which we have the stairway landing, seven rooms of various sizes and the liwan, all grouped round a central space. All stairs are inside, from the exterior the house presents a closed cube. About twenty years ago the court was roofed over by a concrete slab above a clerestory.

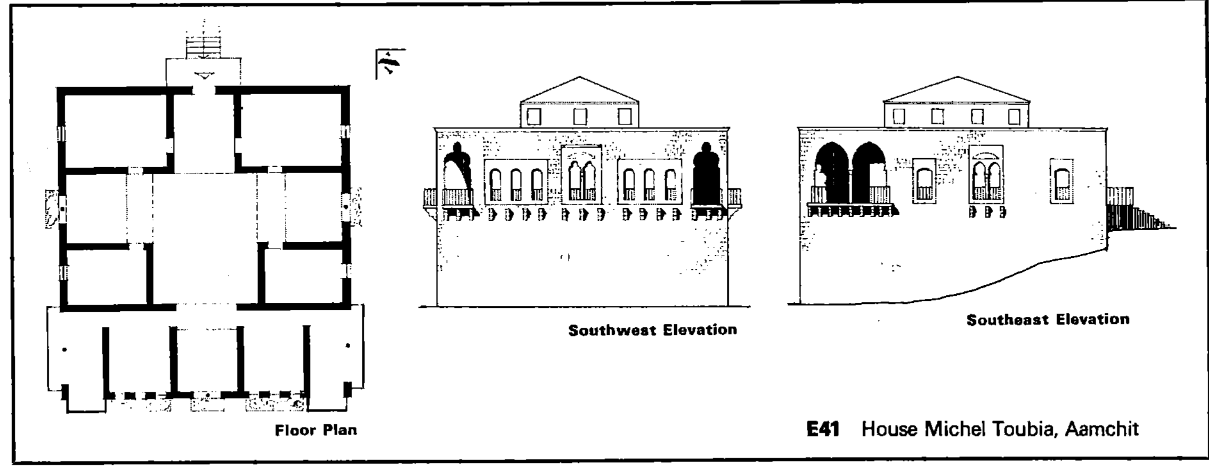
A more sophisticated example of the arrangement described above is house 41. The court, which is directly accessible from the hillside, is surrounded by three liwan units. Towards the sea on the southwest side, corner balconies have been introduced. Here too the court was covered at a later date.

Still more stately is example 42, which has a courtyard of 25 m². Here the liwan motif is modified: the liwans are off-center and serve as passages to a balcony and gallery. This example belongs with the combination types and will be dealt with later.

An excellent example of a liwan scheme is house 43. Three liwan units surround a courtyard on three sides; the valley side is open. The entrance liwan features an entry area with benches through which one steps downward to the court with its central fountain. Right and left are side-liwans, while straight ahead we enjoy the view down to the coast. The wide stairway leads to a lower garden and is a later addition. The slight shift in axes between the north and south liwan is worthy of note. It is caused by variations in the size of the



E40 House Elisee Karam, Aamchit



E41 House Michel Toubia, Aamchit

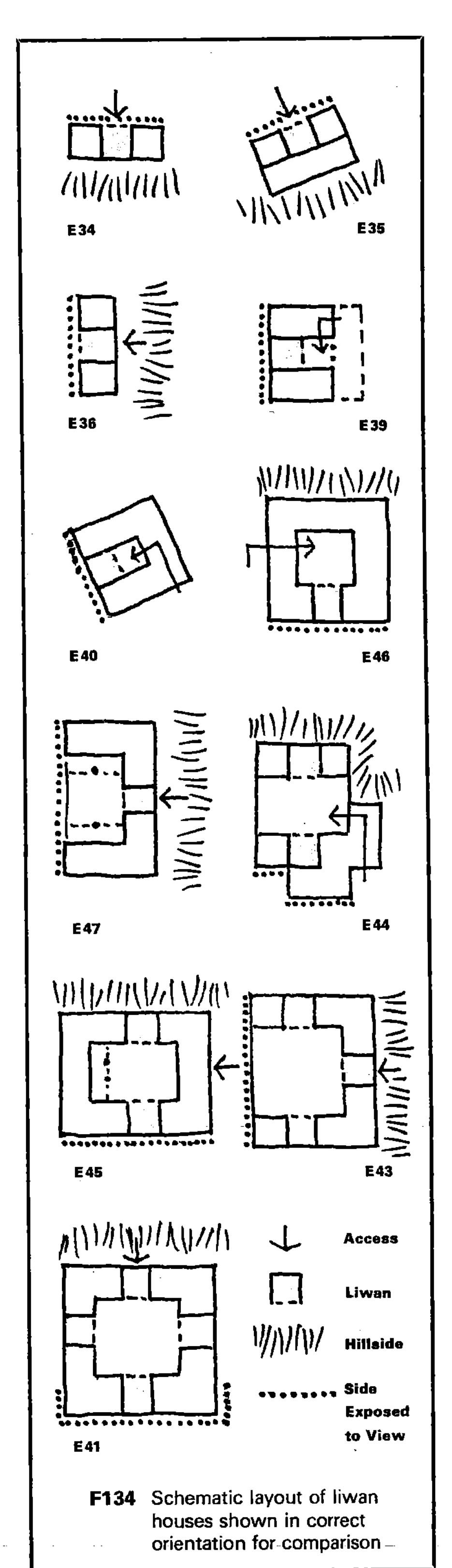
rooms, and lessens the otherwise severe formality of the design. The three liwan units are interconnected by doors designed to eliminate the necessity of passing through the court in bad weather. Still, the three liwan units are well defined and may be designated variably as summer or winter quarters, as men's or women's areas, or as family or guests' wings. Today, one unit is usually turned into the service wing, containing the kitchen and bathroom, facilities which were originally outside under temporary shelter.

The effect of crowded town conditions on the arrangement of houses is shown in example 44. The building adjoins the neighboring structures, and to the north its roof is used by the house above (E45). The courtyard is reached through a sort of guard room from the south, necessitating a 90° turn, which is a typical protective measure in Arab house plans. The direct door from the east seems to have been added later. To the north of the courtyard is the service liwan with its separate fountain; opposite to it is the liwan unit for dwelling purposes, which was later enlarged with additional rooms on the southside. In the middle of the court there is a decorative fountain. The south wing of the building rests on large vaults, which are not connected to the house, but give on to the town square of Deir el-Qamar.

House E45 consists of a court with two liwans and an internal gallery. Again the building is on a slope and has many windows on the valley, but only small ventilation openings on the hillside. The south wing is a later addition. In this example we again find slight irregularities which ensure that the otherwise symmetrical layout retains its playfulness.

Example 46 has almost palatial dimensions. A courtyard of about 15 × 15 m. is surrounded on three sides by living quarters, of which the one to the south is a liwan unit, the east side is closed by baths (*ḥammām*). To the north is an upper floor with a liwan behind a gallery; on the south-west corner a dominating square room with a gallery to the north and an oriel window to the south. The main entrance with its magnificent portal leads to an entry with an L-shaped bench for the servants of the visitors. From here a small door opens to the corner of the courtyard. Diagonally across is a small auxiliary door, probably added at a later date. While the room on the northwest corner can be entered only from outside, the corner room to the southwest has a diagonal connection to the courtyard. This rather awkward solution is found also in the Palace of Beirut ed-Dine. The baths on the east side are reached from the courtyard and open to the adjoining gard(e)n. They consist of the usual domed spaces with lobbies, reclining rooms and the actual bathing cells.

Finally we must look at example E47, which has a court-yard opened to such a degree that it might more appropriately

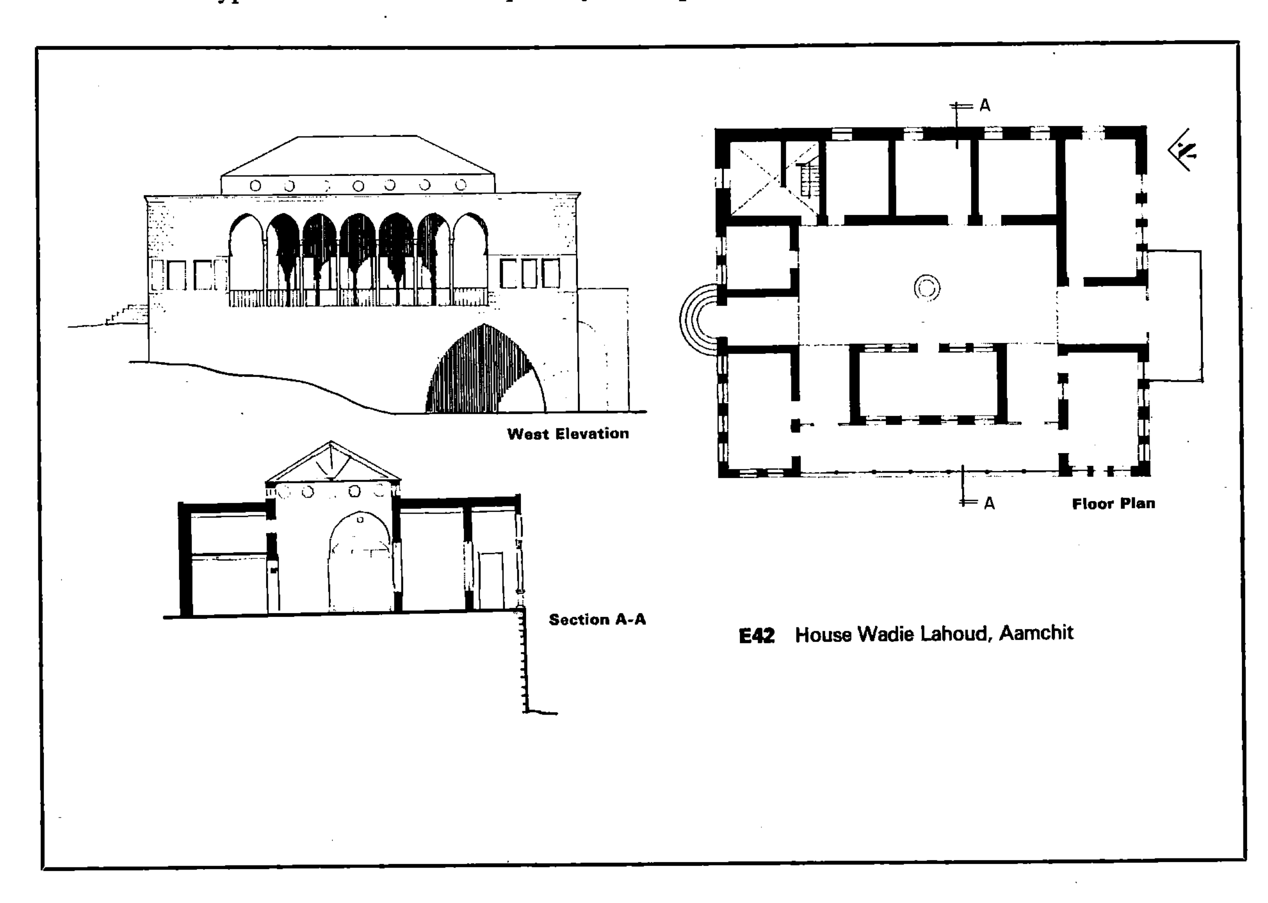


F134 Schematic layout of liwan houses shown in correct orientation for comparison

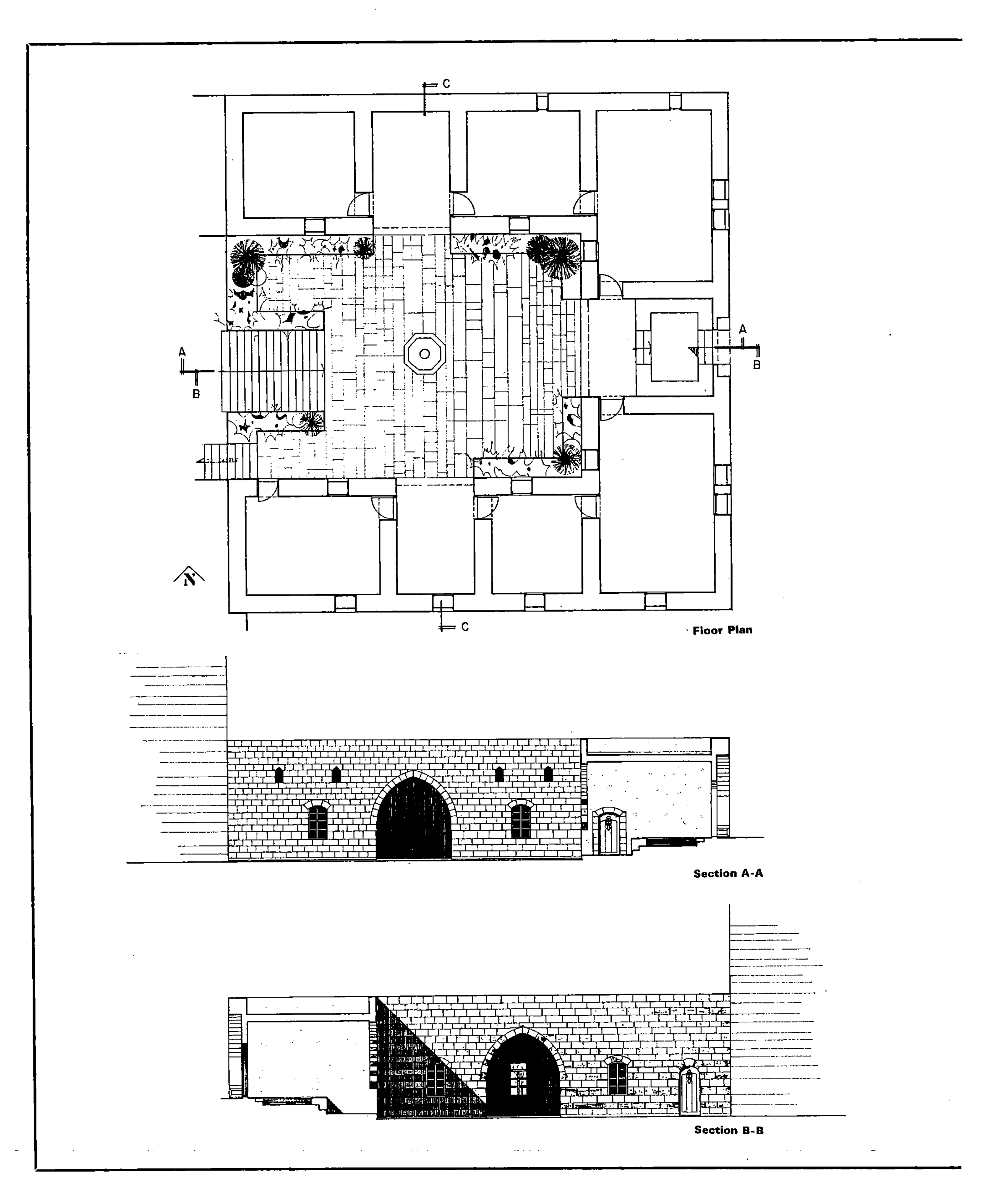
be called a terrace. The liwan scheme is used for the entrance only, while the two wings are arcaded. This plan is similar to a gallery house with projecting wings, the difference being that there the outside space is created by the addition of wings, whereas here the elimination of the valley side of the house turns a closed courtyard into an open terrace.

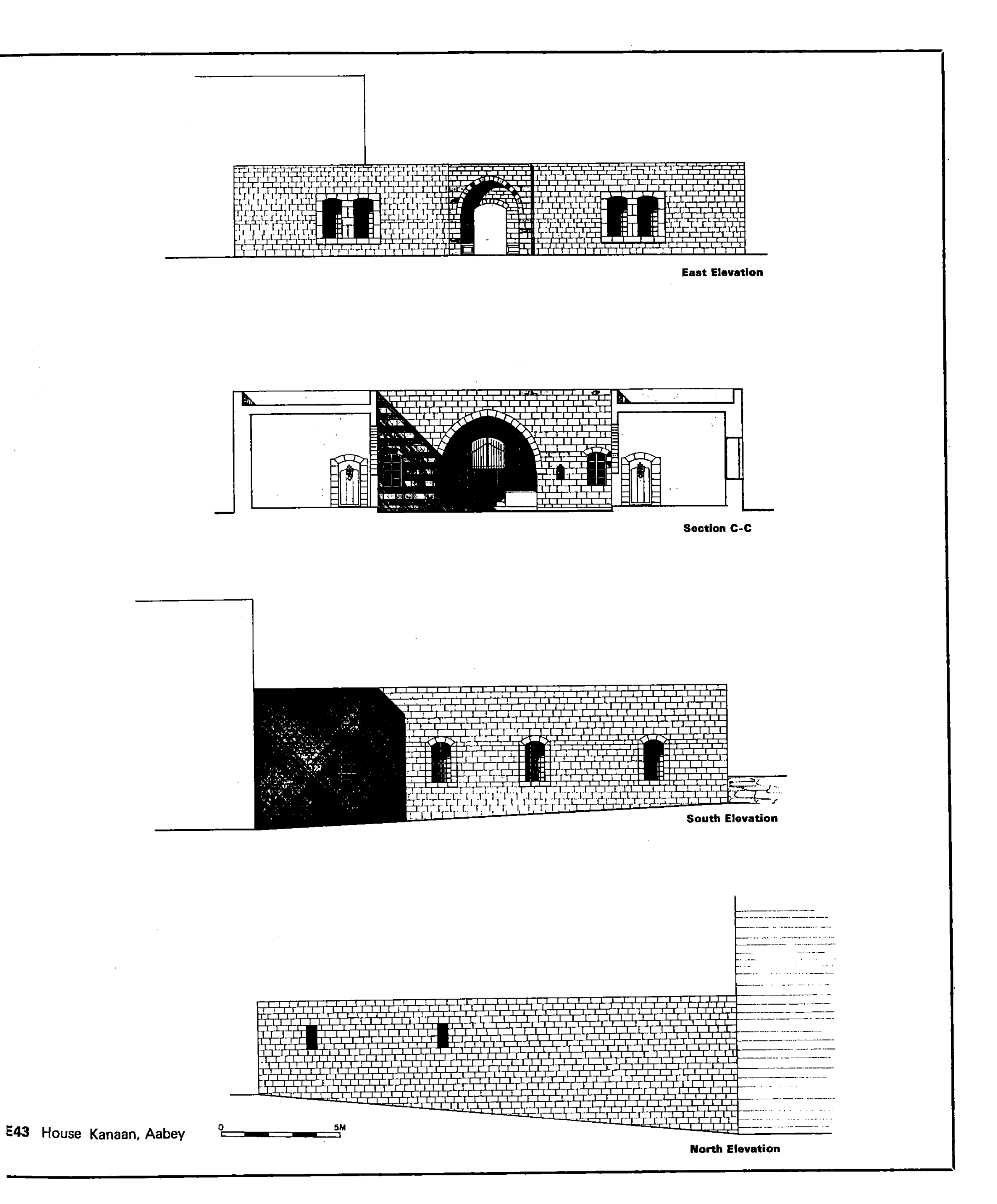
Looking at figure F134 we can say, in conclusion, that the single liwan as well as groups of two, three or four liwans are used. In the case of two liwans, these are arranged opposite to each other with access through the connecting link. On hillside locations the entrance is never on the valley side but always towards the hill or at the sides. When two main liwans are arranged facing each other they are generally oriented north-south, the north liwan being used during winter, as it receives the sun and the south liwan during summer, for the shade it provides (E43, E44, E45). Liwans exposed to the west are usually avoided, on account of the low afternoon sun. The liwan in E47 serves only as an entry.

In all cases the houses are effectively related to the view. Exploitation of the almost ever present view by means of balconies, bay windows and galleries leads to a gradual transformation of the introverted court and liwan principle into a house type which offers both privacy and openness.

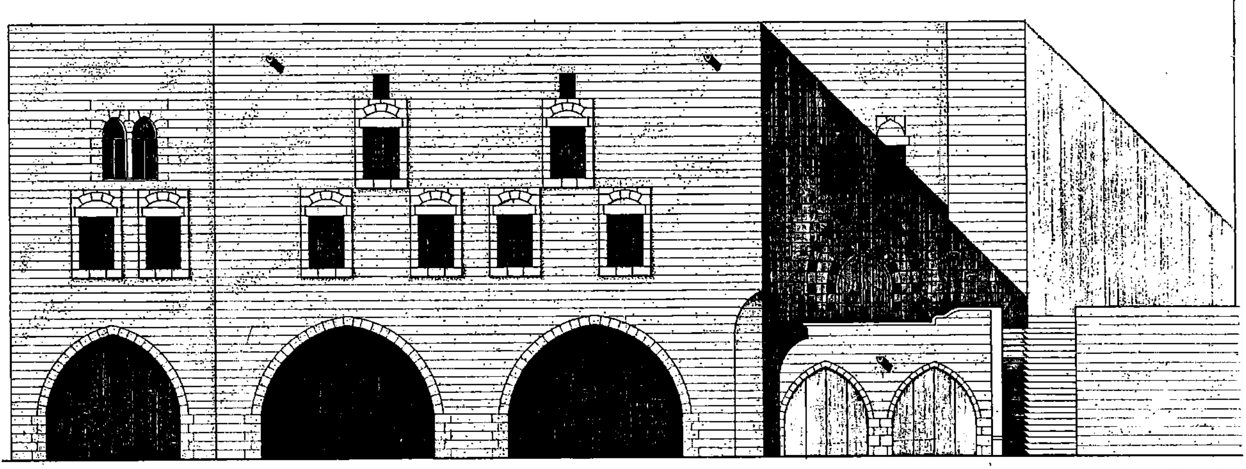


E42 House Wadie Lahoud, Aamchit


C
A
B
A
B
C
N
Floor Plan
Section A-A
Section B-B



E43 House Kanaan, Aabey



South Elevation

A

N

B

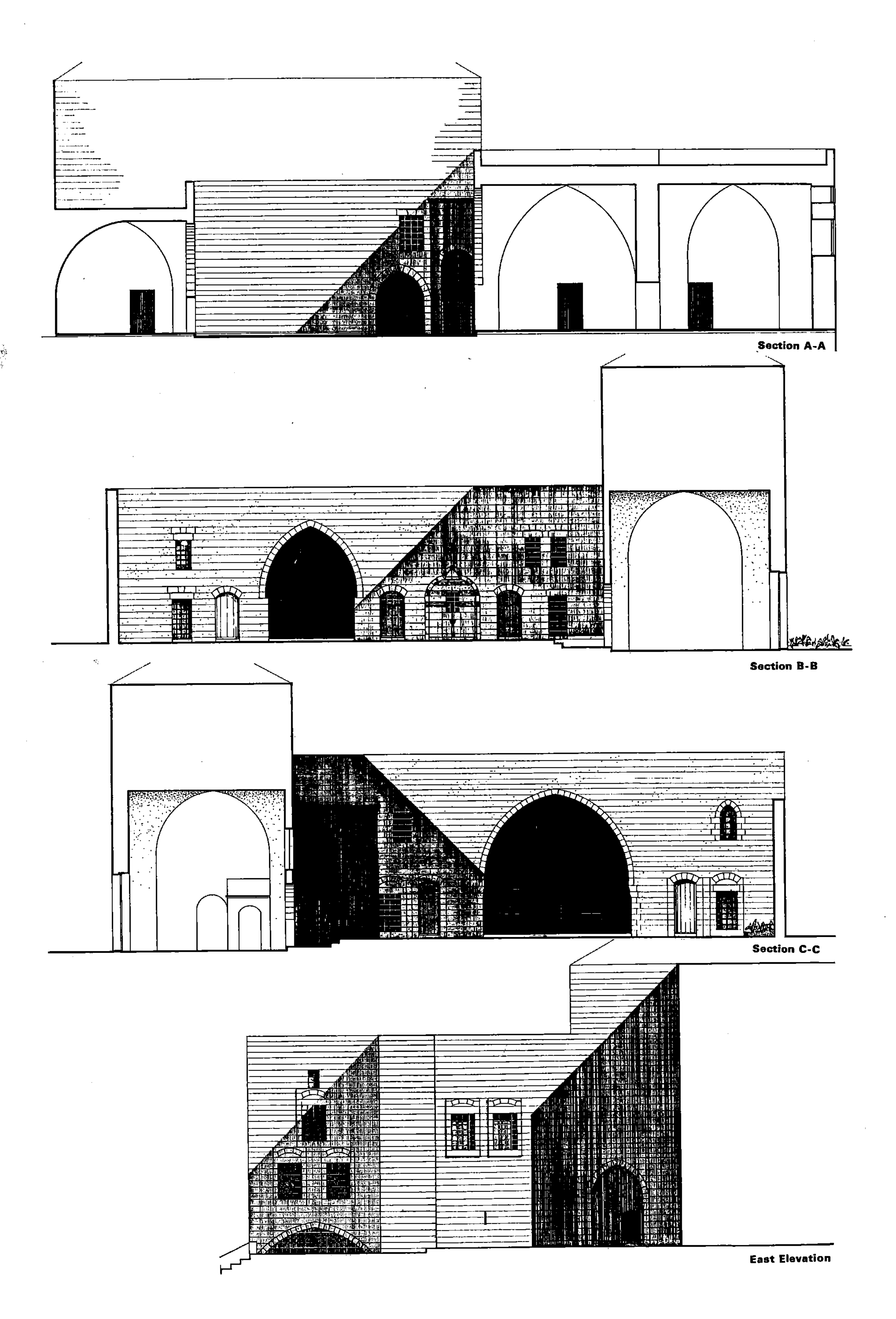
C

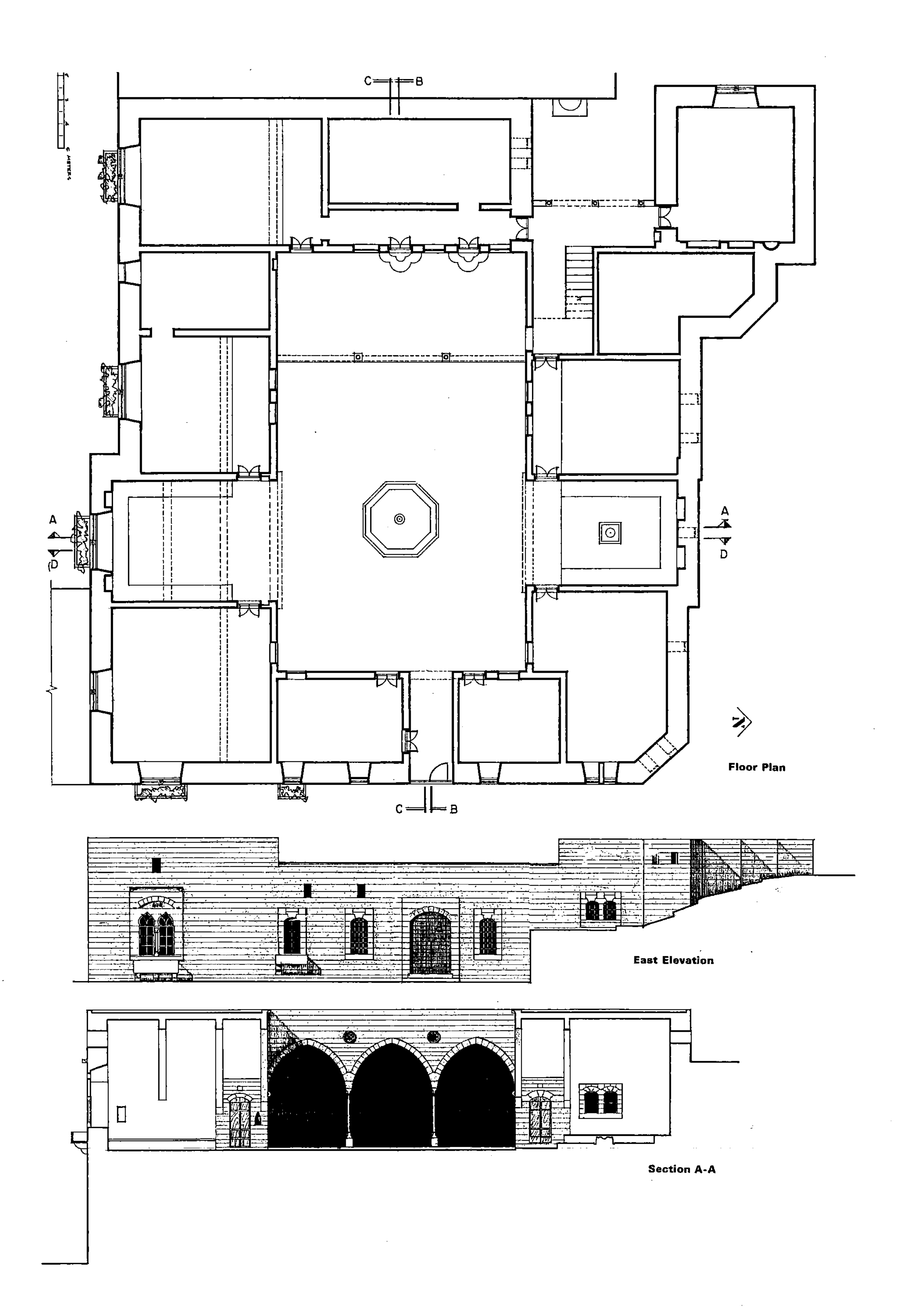
A

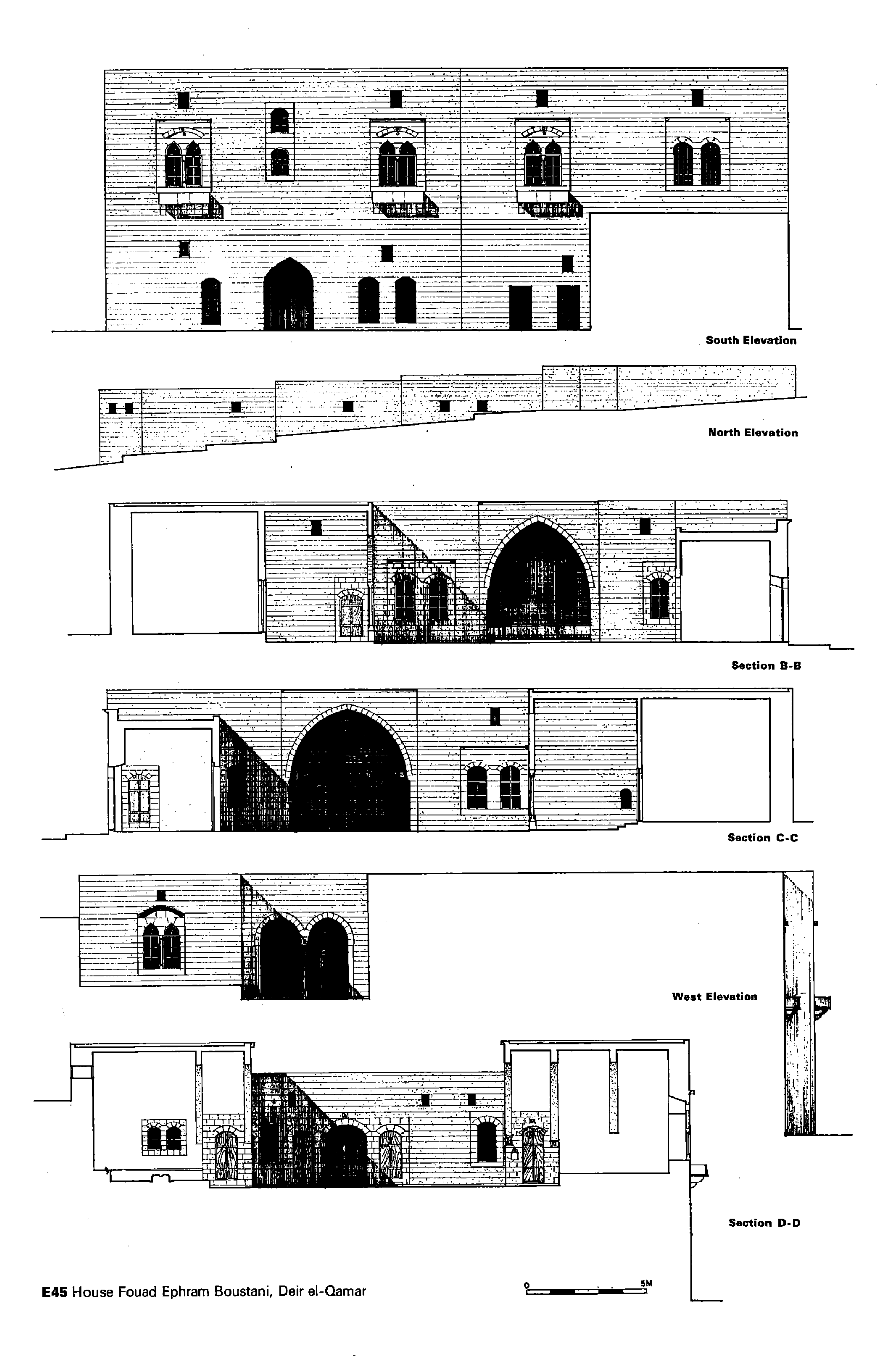
E44 House Emile Baz, Deir el-Qamar

0 5M

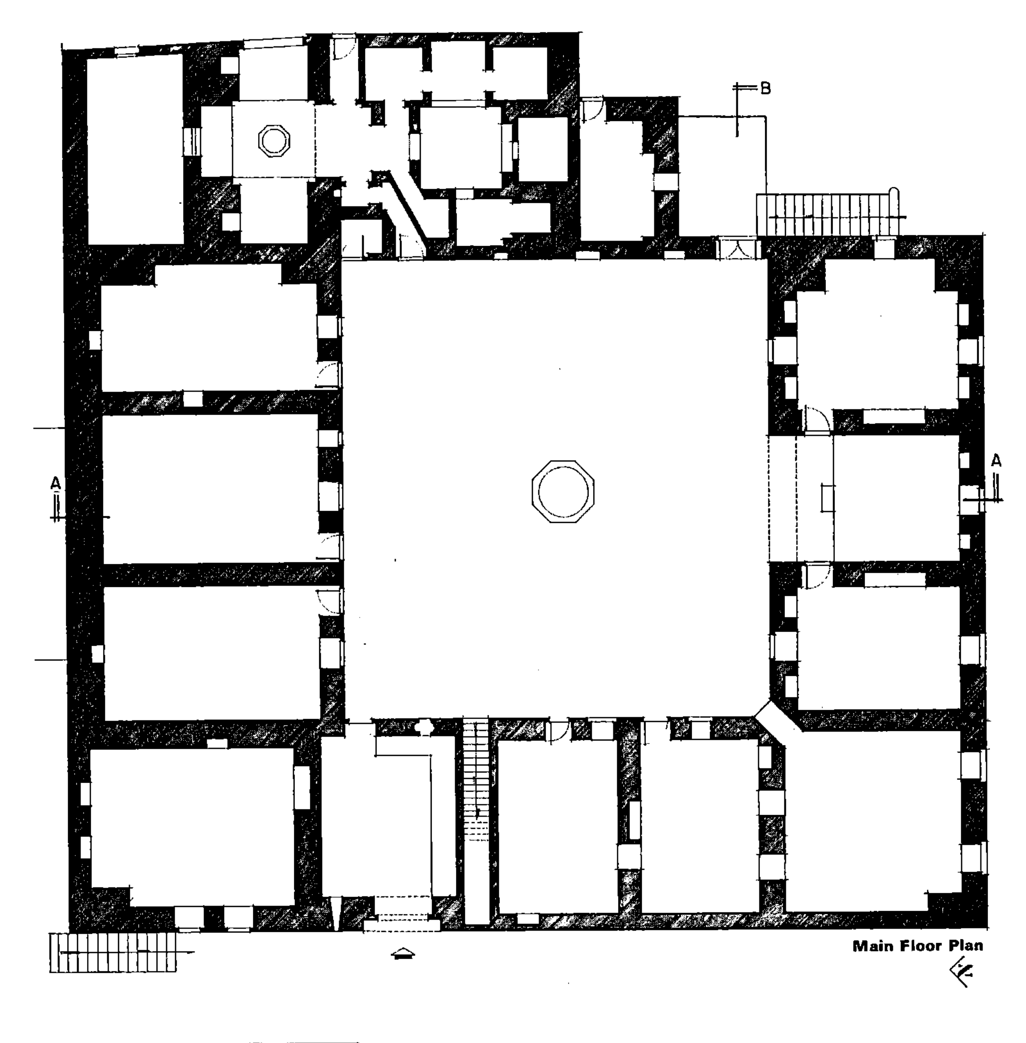
Floor Plan


Section A-A
Section B-B
Section C-C
East Elevation

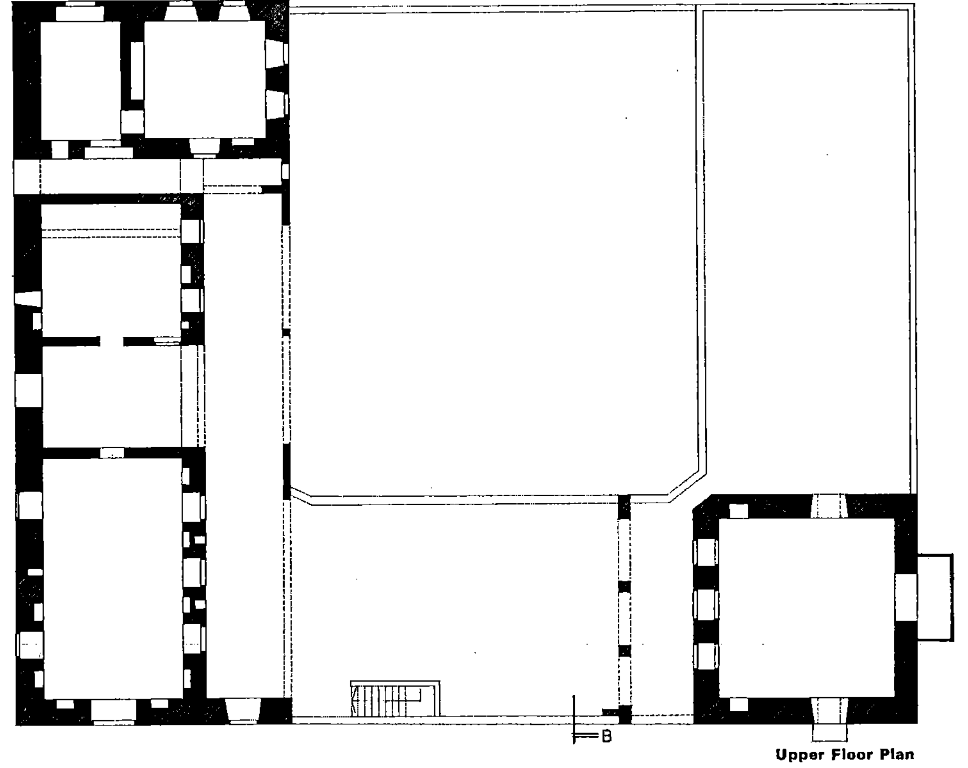

C
B
A
D
Floor Plan
East Elevation
Section A-A



E45 House Fouad Ephram Boustani, Deir el-Qamar



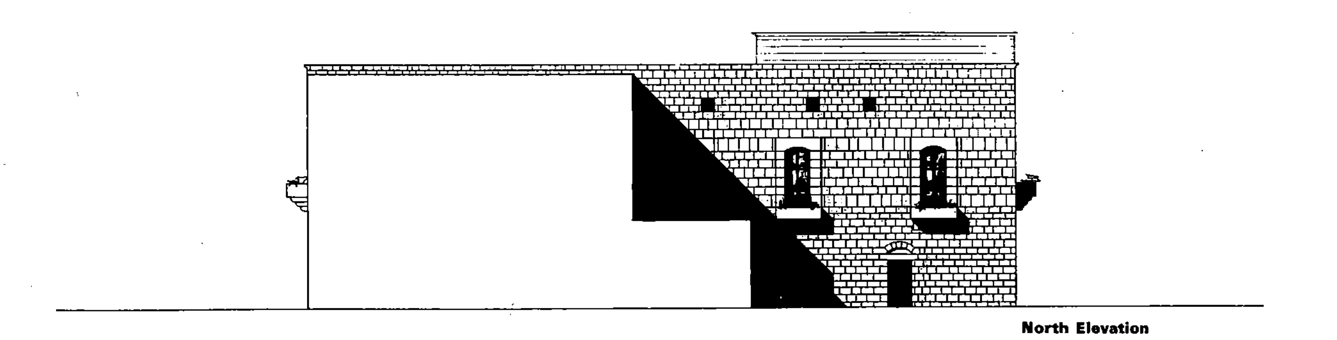
Main Floor Plan



Upper Floor Plan

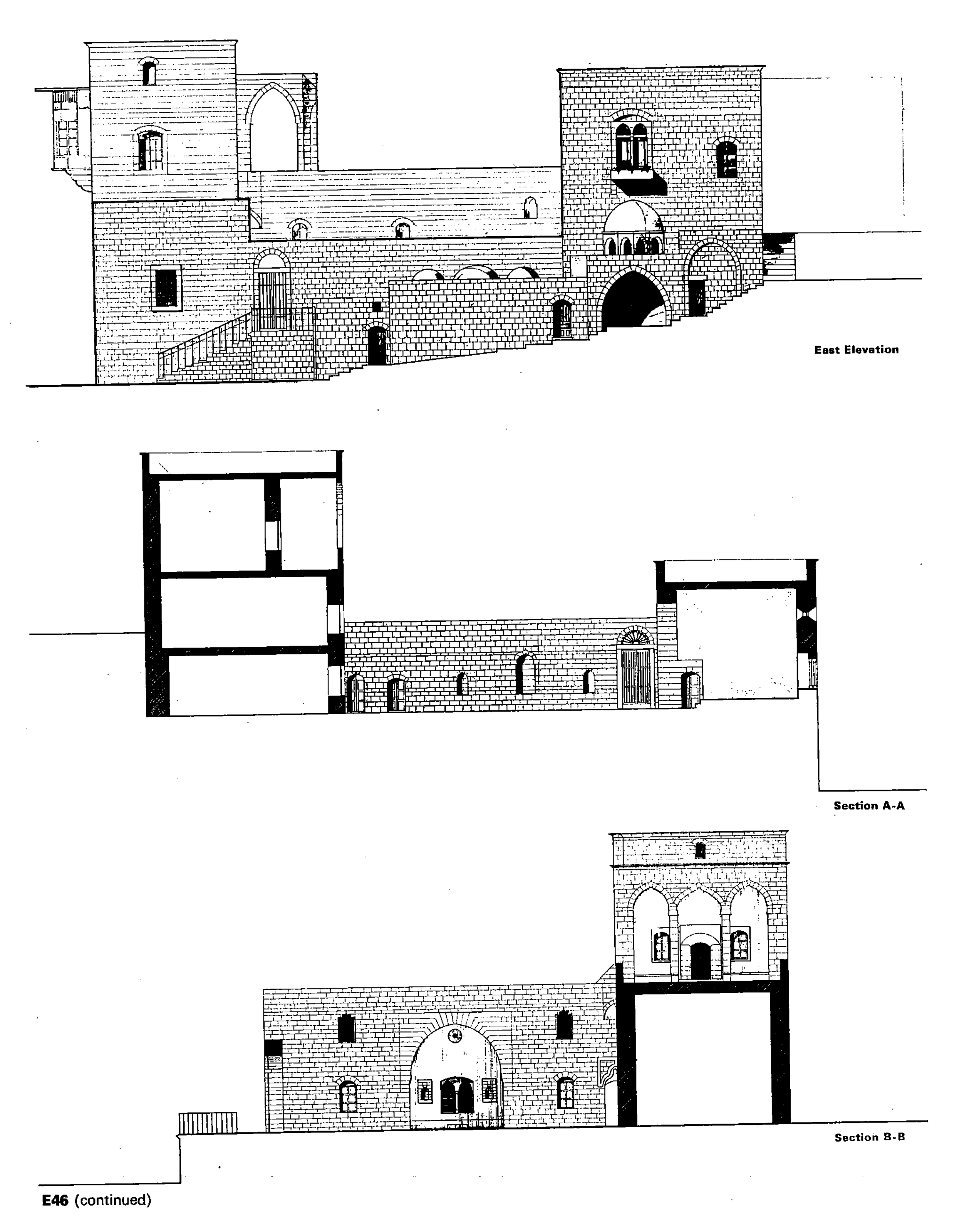
West Elevation

South Elevation

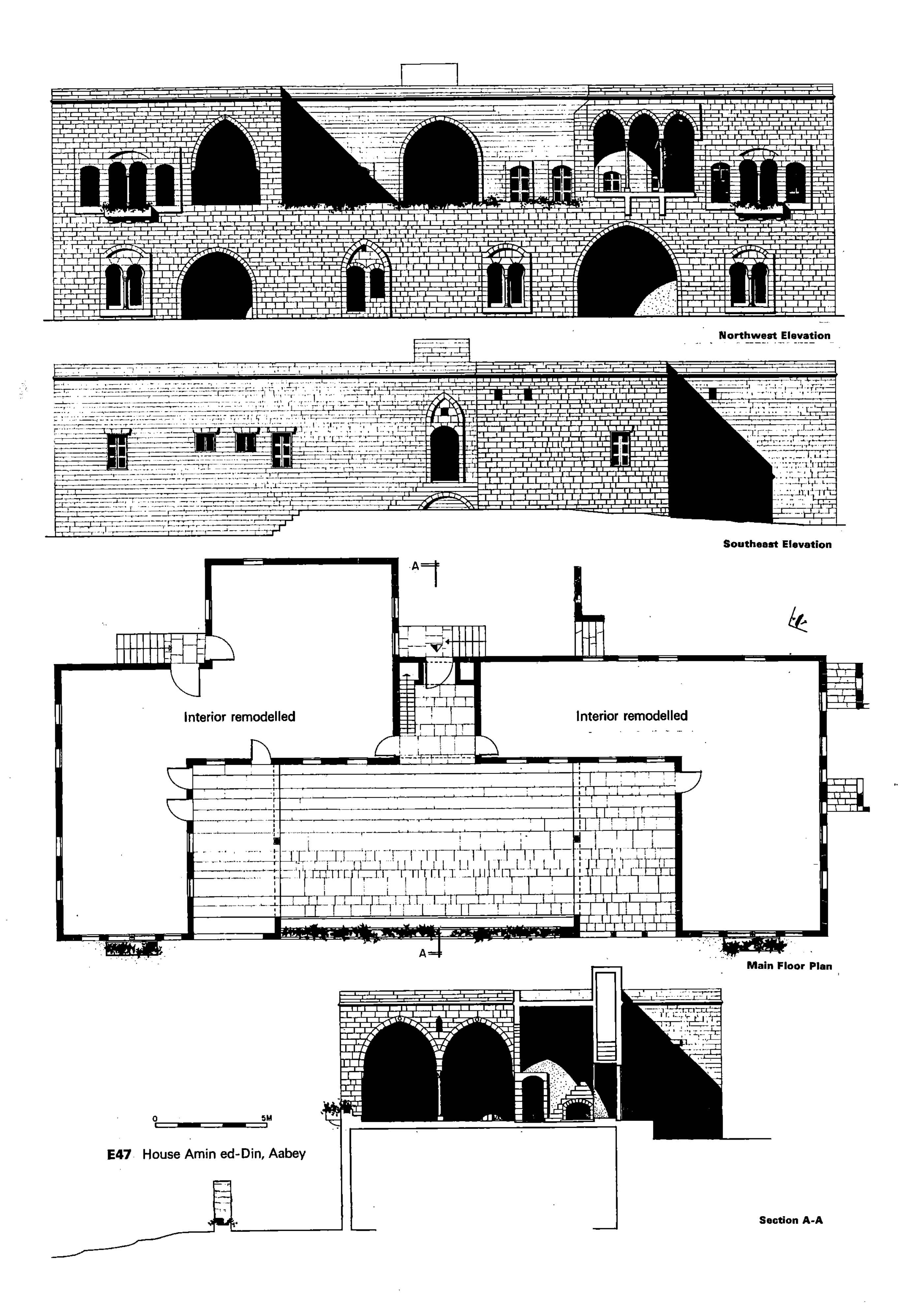


North Elevation

E46 House Baz-Honein, Deir el-Qamar



E46 (continued)

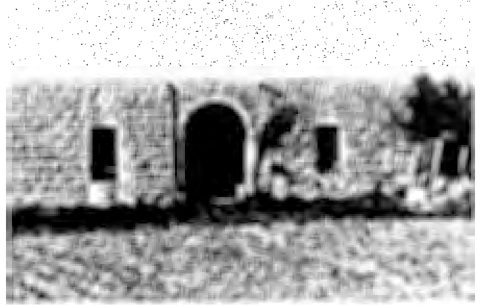


E47 House Amin ed-Din, Aabey

B. CONSTRUCTION



F135 House in the Beqa'a



F136 Moat

WITH THE EXCEPTION of a few mud-brick houses in the Beka'a, where only the arch of the liwan is built of stone (F135) the liwan houses, being an advanced type of house, are always constructed in dressed stone. Usually they have bearing walls composed of two ashlar stone faces and a rubble core measuring a total of 60 to 100 cm. in thickness. The height of the stones varies between 25-35 cm., the length between 25-50 cm., the thickness between 20-30 cm. Tying stones running through the full thickness of the wall are rare, but the ashlar masonry is usually very carefully worked. Apertures up to 80 cm. width are spanned by stone lintels; for larger spans segmental, pointed or decorative arches are employed. The liwan arches are rarely semicircular (F136), but mostly pointed with a slight horseshoe extension. The springing of the arch is always flush with the lateral walls of the liwan, there being no projecting element connecting the arch with the ground. This is typical of the liwan design (F139).

The roofs of simple houses consist of flat timber and earth construction and since the liwan is in most instances more narrow then deep, the beams run parallel to the arch, which means that the arch does not carry any weight. This happens in E34, E39, E40, E42 and E43 where the width of the liwan stays below 4 m. If the width is greater, several arches are thrown across the liwan and the beams run parallel to the depth of the space (E38, E45).

In the remaining cases the liwan, like the rest of the house, is vaulted. On the hillside a barrel vault is generally placed parallel to the contours, and opened to the valley or courtyard by transverse vaults over each space (E44, north side). Of course, there are also groin vaults (E44, south side). Barrel vaults parallel to the axis of the liwan are seldom found in dwellings (F136).

Today, most well-to-do houses such as E43 have the original timber and earth roofs replaced by reinforced concrete slabs. Liwan and court houses rarely have tiled roofs, because they are usually quite old and their irregular plan makes it too complicated to tile such roofs. The subsequent roofing of courts was partly done by means of hip roofs (E39, E41, E42) and partly with reinforced concrete slabs (E40).

C. EXTERIOR DESIGN

THE EXTERIOR DESIGN of the Lebanese liwan and court house is of unexpected importance. Although the liwan itself can only be seen from the outside in a free standing house (E34, E35, E36), the liwan house and related court houses reveal a great variety of facade treatments, all of which were designed to exploit a fine view and to make the most of a commanding position of the elevation. As a rule the view is down the valley, and this side of the house carries several windows

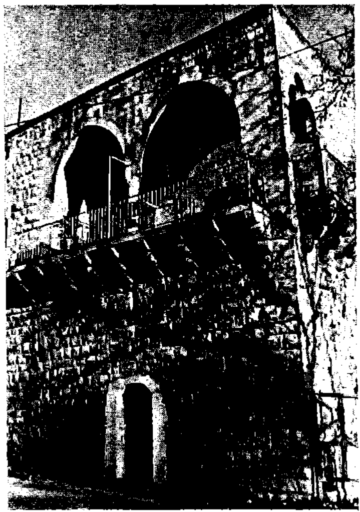
which are usually arranged in groups. Owing to the sloping site or to the position of the living rooms on the upper floor, the windows of the main floor are always high above ground and out of reach from the outside (E36, E39, E40, E41, E44, E45, E46). If necessary the opening of the facade is carried round the corner (E40, E41, F137); several facades are equipped with fine windows (E40, E41). Buildings with U-shaped plans have the court open towards the view (E43, E47), making them similar to gallery houses with projecting wings. Usually the court elevations of the houses are carefully designed, too (F138).

The liwan on the side of the view always receives a window in its rear wall which is distinguished in the facade by its size and decoration (E38, E39, E40, E41, E45, E46). This evolves into a hierarchy of windows which is strictly adhered to. The scope extends from the small ventilation hole to simple secondary apertures, through the arrangement of windows in rows to coupled windows, with or without high vents, and on to the embellishment with planters. In addition to this there are French windows, oriel windows, balconies and galleries.

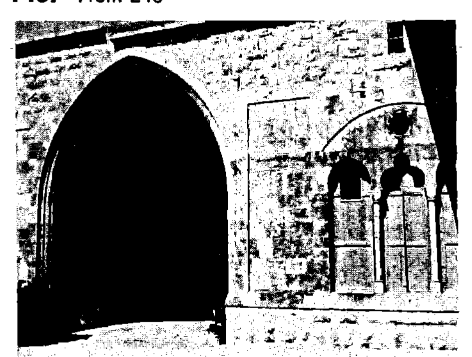
The elevations are always designed from the inside and derive from the internal space organization. Even when the design appears to be strictly symmetrical, small irregularities can be noticed which enliven the composition. The multi-floor courtyard house on a hill, in particular, presents a large elevation which offers fine design possibilities. Windows may be carried down to the floor and provided with alcoves for sitting (*mandalūn*), or they may be placed close to the ceiling to give light and air to the room. This offers the possibility of a rhythmic juxtaposition of windows which is visually most effective, as seen in example 44 (E44, south elevation). In this facade we also observe the slight shifts in axes, the free composition of elements in a surface. At the same time the repetition of the basic motif and the dominance of the continuous wall surface above the stately vaults lends a quiet monumentality to this elevation.

More differentiated and playful is the design of the east and south elevations of E45. The special design of the liwan window is here repeated for three more rooms. In the south elevation upper and lower floors are independently designed, with the emphasis on the top floor. Special mention should also be made of the north (hill) side of the house which is closed except for a few secondary windows.

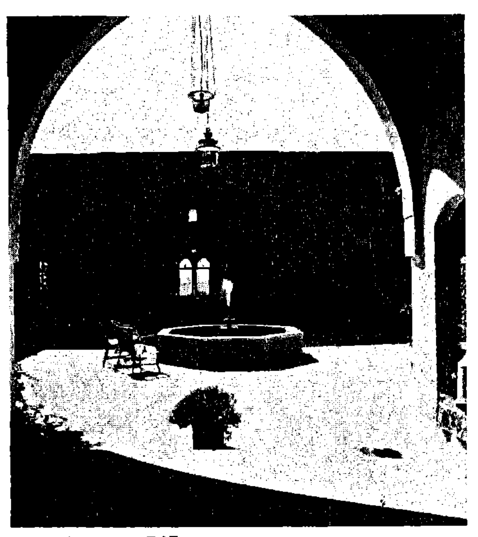
Still more varied, while remaining well balanced, are the elevations of E46. The two main facades (south and west) contain fifteen different sizes and shapes of windows, to which we have to add an oriel and the portal. The liwan window on the south side is combined with a circular high opening. Nevertheless the character of the courtyard house



F137 From E40



F138 Moukhtara



F139 From E45

is maintained, since the closed wall surfaces predominate, and the elaborate portal is typical for entrances to large internal courts.

The special position of example E47, as already observed in the plan, is also expressed in its elevation. The facade is dissolved to the point where voids and solids are about equal. The proximity of some elements already creates certain tensions, as can be seen on the right side of the northwest elevation.

As regards the execution of the work the walls are made up of approximately 30 cm. high stone courses. Remarkable effects are achieved by slight variations in the surface finishing. As a rule the bottom floors are built in quarry-faced masonry with 2-3 cm. mortar joints, while the top floors are smoothly finished. Liwan-door and window frames are usually of bushhammered stone with hair joints. Groups of windows are combined within slightly projecting smooth wall-panels; workmanship is generally first class (F137, F138).

D. INTERIOR DESIGN

The interior design of liwan and courtyard houses purposely includes the open external spaces. In the pure liwan scheme the side rooms are related to the liwan, while the liwan is related to the open space in front of it, which consequently needs definition. The extension of the liwan space into the open air is emphasized by the absence of any sort of separation, by the continuity of floor levels (though the inner liwan space may be raised by one step), and by the smooth merging of outer and inner wall surfaces (F139).

In the detached liwan house without courtyard (E34, E35, E37) the liwan appears as a shelter for the people who live predominantly in open surroundings. Looking out from within, the liwan space seems to flow away, and the feeling of beeing out of doors continues. Only after entering the lateral rooms is there an impression of being indoors. This condition changes fundamentally as soon as an enclosed courtyard is attached to the house. Since one first enters the courtyard, which serves as both traffic and living area, the spatial impression is dominated by the court's volume, of which the liwan appears to be a covered extension. Under rural conditions the yard is used for service and working purposes, and, in order to separate soiled and clean areas, the inner liwan area is raised, while the access to the lateral rooms is on the outer level. In the clean courtyards of residences, this change in level may be omitted (E45, section A-A left), but it is usually maintained as a safeguard against rainwater and for its aesthetic effect (F140).

The liwan serves as reception space and common living area for the family; it neither belongs to the *maskan* nor to

the *madāfa,* but can be reached easily from either. In larger houses each section has its own liwan. Whatever the case, the liwan is the central theme of the design and often subject to embellishment. Usually it is furnished with benches running round the walls (*dīwān*) and a fountain (E45 section A-A right).

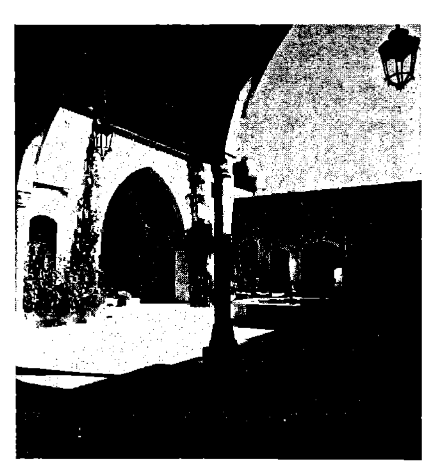
In the closed courtyard scheme the main liwan is always constructed on the valley side and has a window in its rear wall. The view to the outside is then enhanced by the studied design of the opening, usually a window with central colonette and flowerbasin (E38, E41, E45, E46). However, the size of the window is kept to normal dimensions, in the correct realization that otherwise the sheltered character of the liwan would be destroyed. The harmonious interplay of extroverted and introverted principles, the interrelation of open, covered and closed spaces, the effect of surprise given by the far view through the liwan window, are all handled with great mastery.

Quite different is the expression of a courtyard open to the view (E43, E47). In this case the composition of the house centers around the prospect offered by the site. Since the house is entered from the side or the rear, the element of surprise is always preserved. In fact, the depth of the entrance liwan strengthens the effect of the vista. There is the possibility of enrichment by galleries (F141), but the succession of gallery and liwan as practised in Syria and Iraq is very rare (E46 top floor).

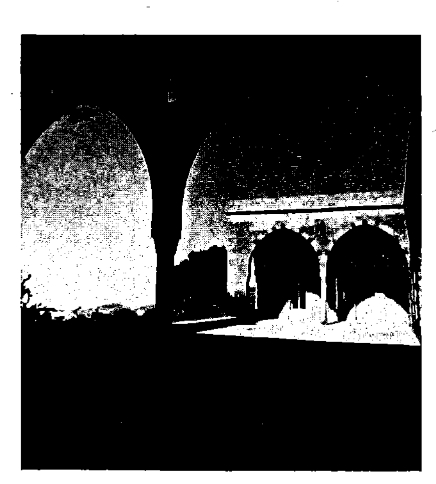
The courtyard houses of Aamchit are a special case (E40 to E42). With the subsequent covering of the courtyards —the width in E42 is seven meters—and the introduction of a clerestory, the houses gain a central hall which suited the living habits of the Lebanese. Since the ceilings of these halls are large and well illuminated, many of them were decorated with stucco and painting (F142).



F142 House Gabriel Lahoud, Aamchit



F140 From E45

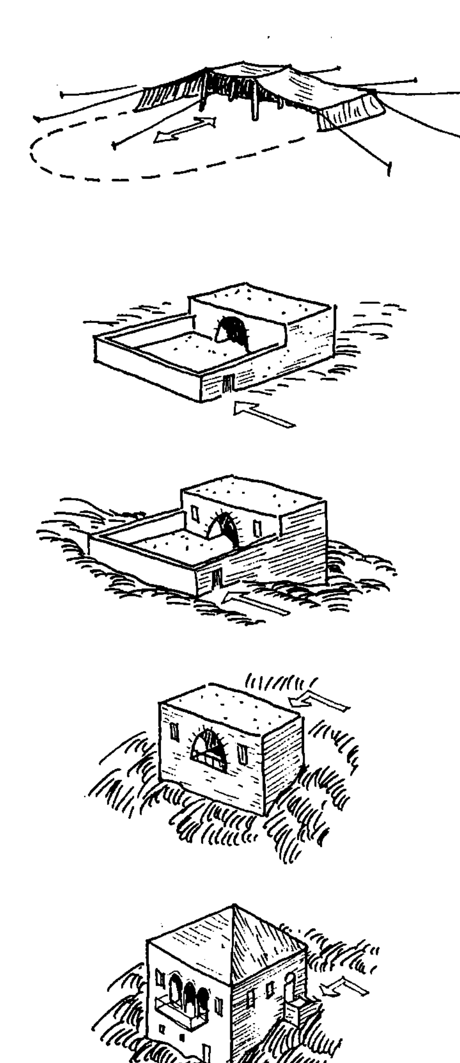


F141 From E47

E. ORIGIN

THE TERM LIWAN, in non-Arab countries generally named iwan, is of Persian origin. It is a shortened form of al-aiwan, the Arabization of aiwan, which is Persian for open space.[27]

Badawy discerns the liwan plan in house VIIIA of Tepe Gaura (3000-2800 B.C.).[28] Ghirshman identifies four liwans in the "Square House" of Nysa, in the Parthian architecture of the third and second centuries B.C.[29] Actual remains of huge vaulted liwans date from Sassanian times. One of the largest existing vaults of antiquity is part of the palace at Ctesiphon, probably from the fourth century A.D.[30] The palace of Ukhaidir, eighth century A.D., has liwans both in the state apartments and in the residential sections.[31] The liwan is the main motif in the numerous caravanserails of Persia and Anatolia, and supplies the keynote of the *madrasa* mosque scheme. Finally, even today the liwan unit is a typical house form in Persia, northern Iraq and northern Syria. The liwan being a covered space which is closed at three sides but completely open on the fourth, constitutes a puzzling deviation from the closed rectangle scheme. Why should one whole wall be missing? What tradition could lead to this solution? Possibly this arrangement was derived from the Bedouin tent: there we have the three sides closed against the wind while the fourth side is open. The highest part generally is in the middle while the side portions may be screened off, as deemed necessary.[31a] Outer space merges freely with sheltered space, as perfect expression of the nomadic way of life. In the settled environment the open space in front of the liwan usually is walled in to form a courtyard. This creates a difficulty when we are on a sloping site, as is the usual case in Lebanon. Whether we turn the liwan towards the mountain or the valley, expensive substructures will be needed, unless we decide to keep the liwan scheme without a terrace, open it to the valley side but put a railing, and enter through the rear wall. In this case the large arch becomes superfluous and may as well be replaced by an arcade. The central hall house will be the result (F143).



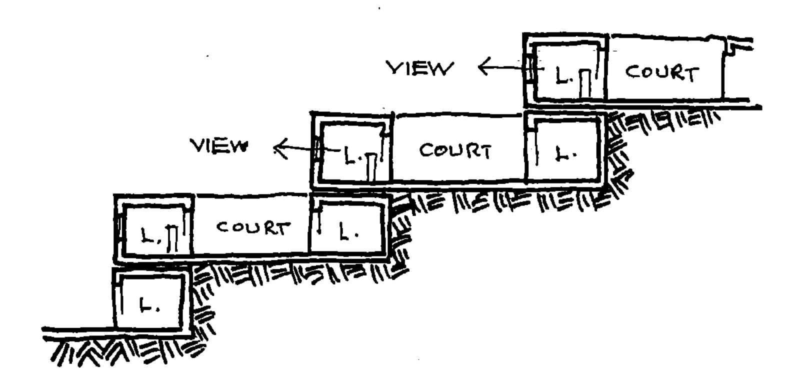
F143

The Arabs seem to have brought the liwan house to Lebanon. Since it was generally connected with a courtyard, this scheme was predominantly used in towns. In this case several liwan units could be arranged in a U — or even □ — shape. The resulting closed courtyard must be carefully distinguished from the classical atrium. The atrium was not the result of the successive arrangement of wings which delimited an open space in their middle, but originated from a hall, illuminated through an opening in the middle of the roof.[32] As the opening grew larger, the hall obtained the aspect of an open space, but was always surrounded by a continuous covered passage, usually a peristyle. In Lebanon the very absence of such continuous passages, and the fact that the roofs do not project into the courtyard, indicate the

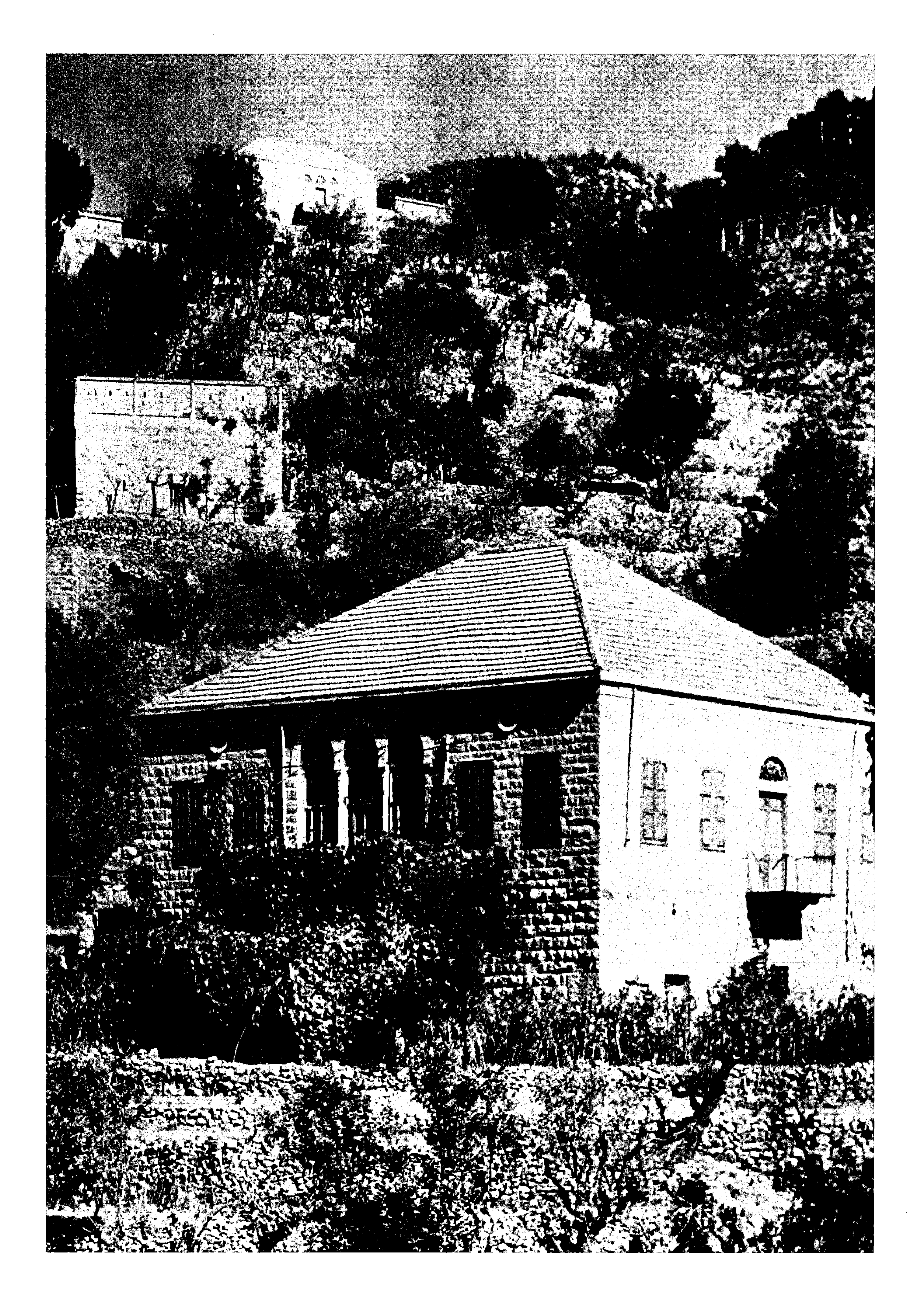
non-classical origin of the courtyard houses.

The house built around a courtyard is, by necessity, fairly extensive. It will contain variously oriented wings, which could be dedicated to different seasons of the year or clearly differentiated functions. Their closed character offers privacy and safety. The large courtyard house also resembles the Arab palace or the Damascene house. For these reasons most of the oldest significant residences in Lebanon built by the ruling families during the eighteenth century are courtyard houses (E43, E44, E46, E47).

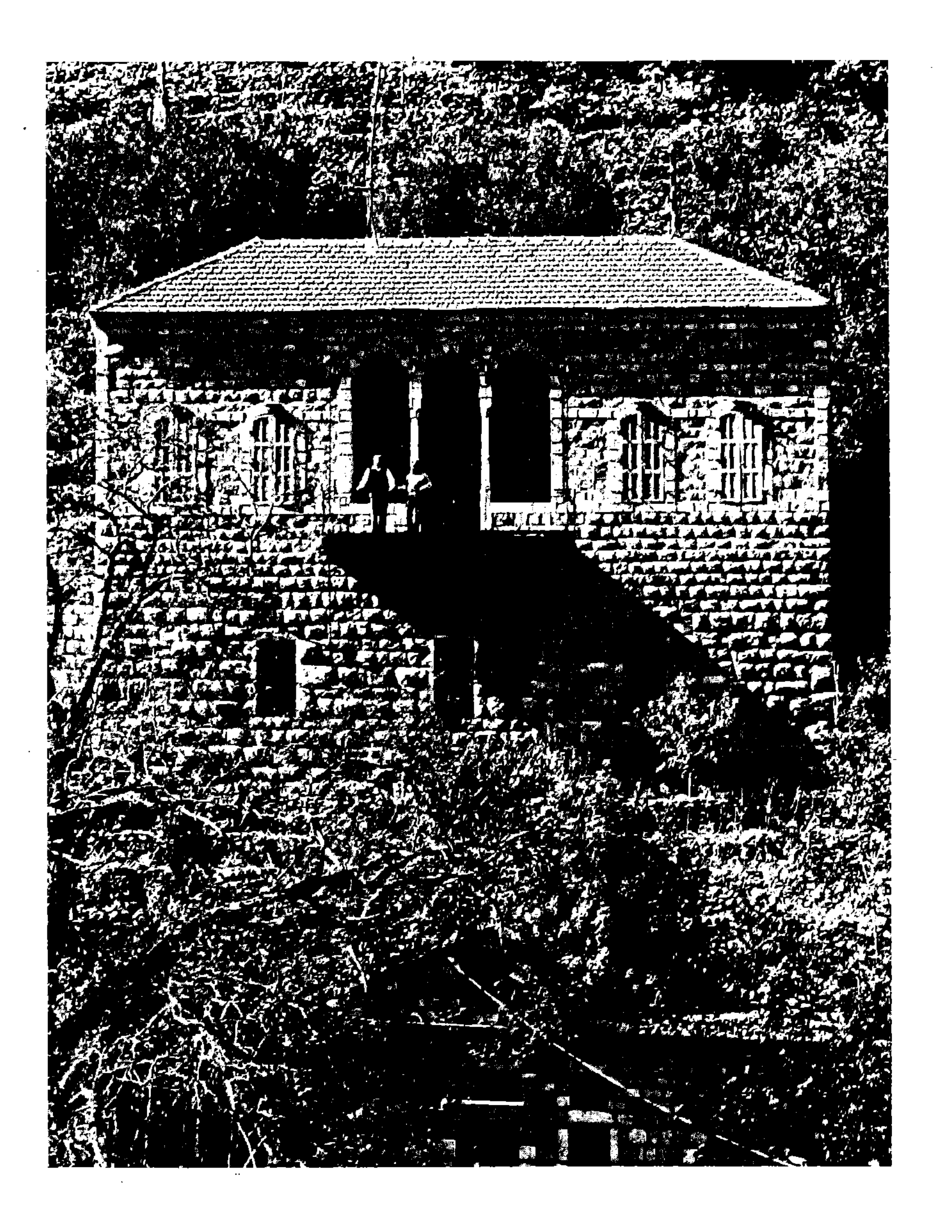
In the case of hillside villages such as Deir el-Qamar terraced courtyard houses have emerged where adjoining houses overlap each other — a very efficient way of land use (E44, E45, F144).



F144 Cross section of terraced courtyard houses



4. The Central Hall House

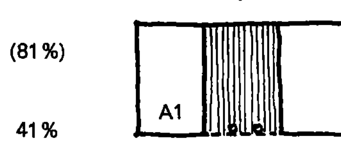


A. PLAN

ALTHOUGH THE HOUSE with central hall appears in Lebanon at a later date than the types so far described, it is the most prevalent kind of house in the country. It is the Lebanese house *par excellence,* the type of house most often repeated and attaining the highest degree of identity. In neighboring Palestine and Syria it is rarely found. Sinjab defines three house types as typical for Syria: Liwan type, *Riwāq* type and Combination types,[33] and G. Dalman distinguishes in Palestine the following house types: house without internal supports, house with columns, house with arcades, vaulted and city house.[34] Among the plans he shows, there is no central hall scheme.

Even though our present collection of twenty-seven examples does not represent an extensive sampling, the percentages below give a rough indication of the frequency of the various types of central hall houses. The twenty-seven examples (E48 to E74) were arranged according to plans and we may recognize the following system:

A. Single access to main floor: (81%)



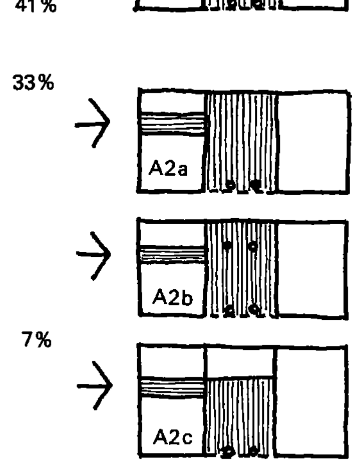
1. Access to the central hall directly from the rear (E48-E57, E59); with the exception of E52 and E56 the entrance sides of the central hall contain only the door. 41%

2. Access to the central hall indirectly from the side via a corridor. 33%

   a. Central hall takes full depth of house (E61, E62).

   b. Central hall is subdivided (E60, E63, E64, E67).

   c. Central hall is surrounded by rooms on three sides (E65, E66, E68). 7%

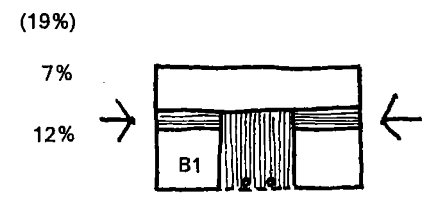


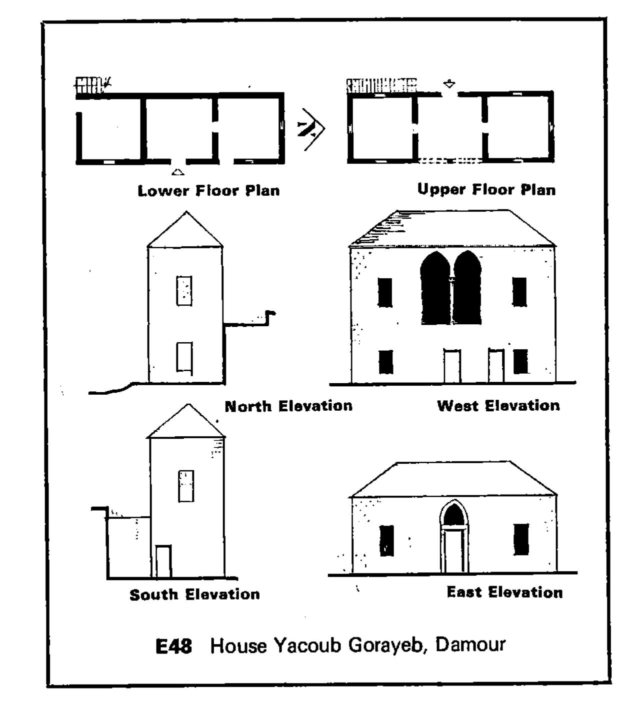
3. Special Types:
   a. Transverse position of hall (E58).
   b. Crosswise position of central hall (E69).

B. Multiple access to main floor: (19%)

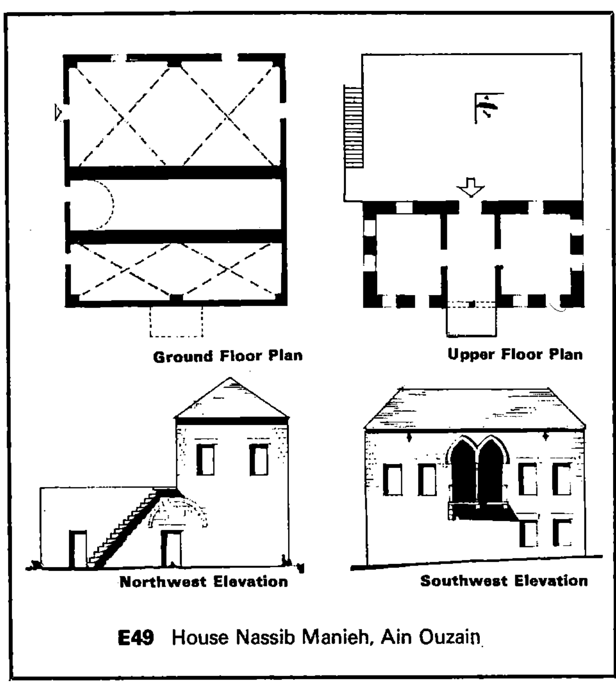
1. One entrance on each side (E70, E72). 7%

2. Special Types: 12%
   a. Two central halls at right angles to each other (E72).
   b. Central hall with five arches (E73).
   c. Side by side combination of two central hall units (E74).

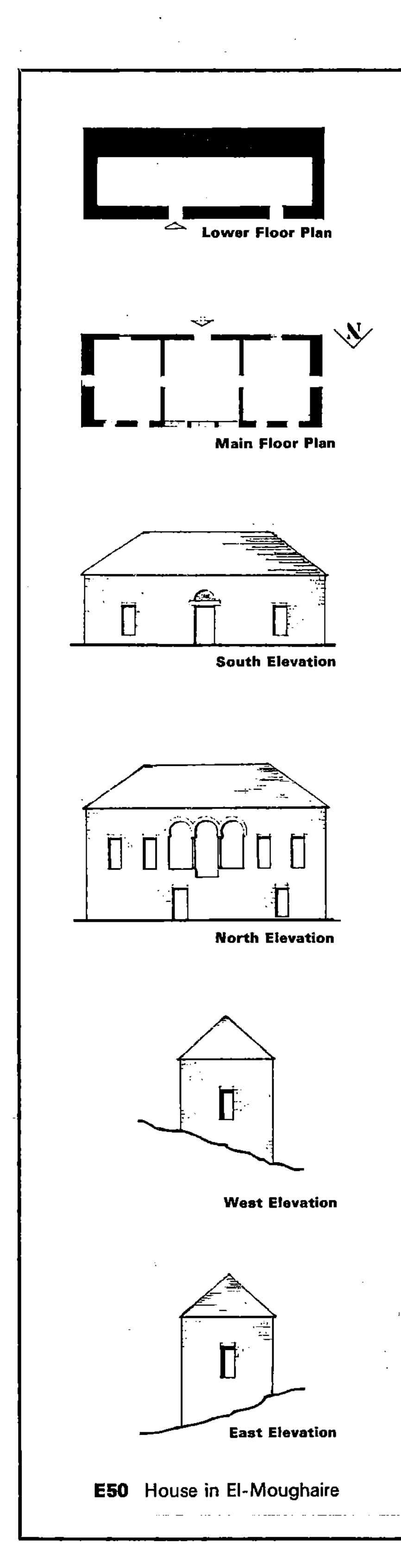




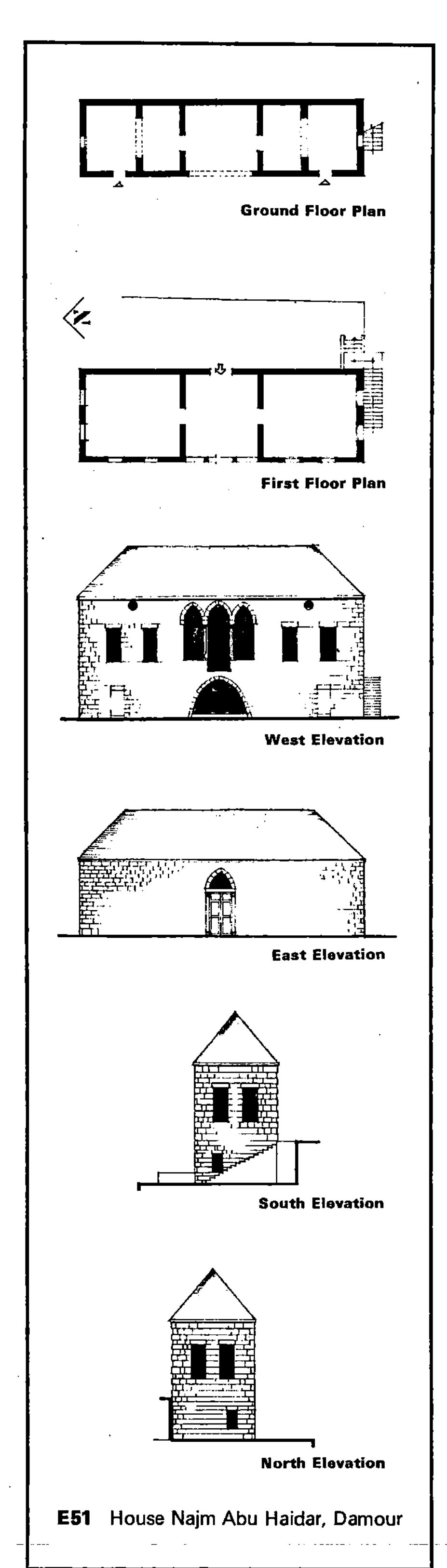
E48 House Yacoub Gorayeb, Damour



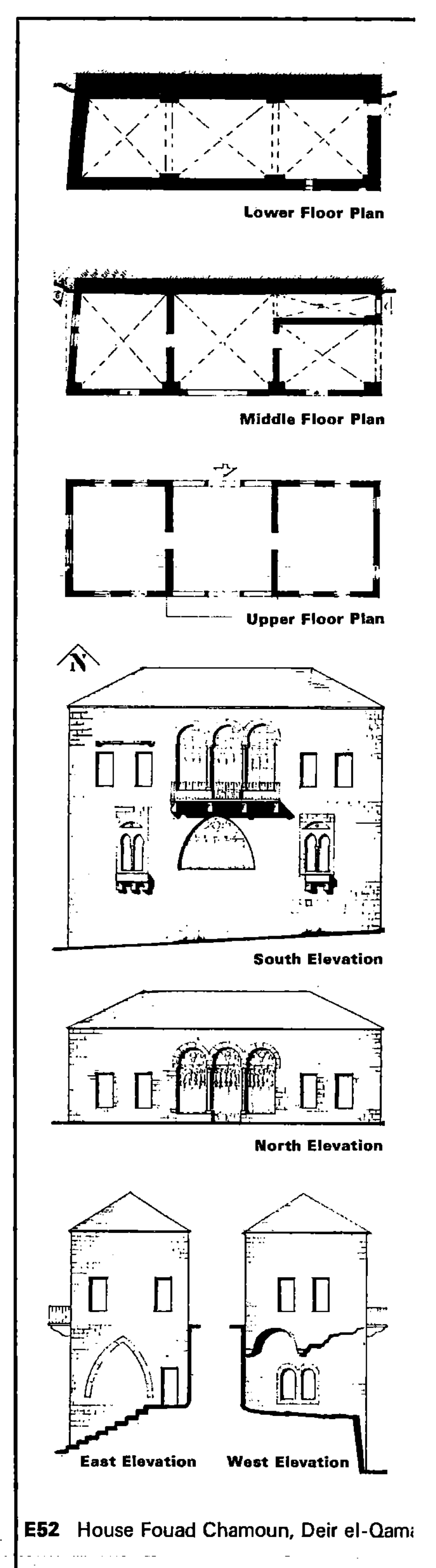
E49 House Nassib Manieh, Ain Ouzain



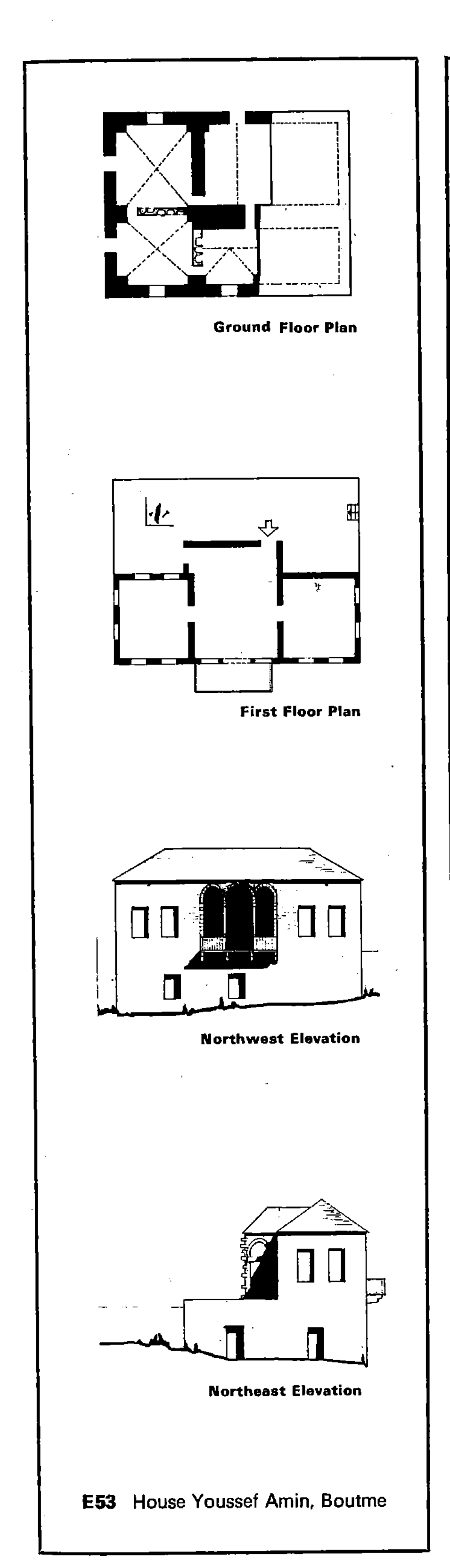
E50 House in El-Moughaire



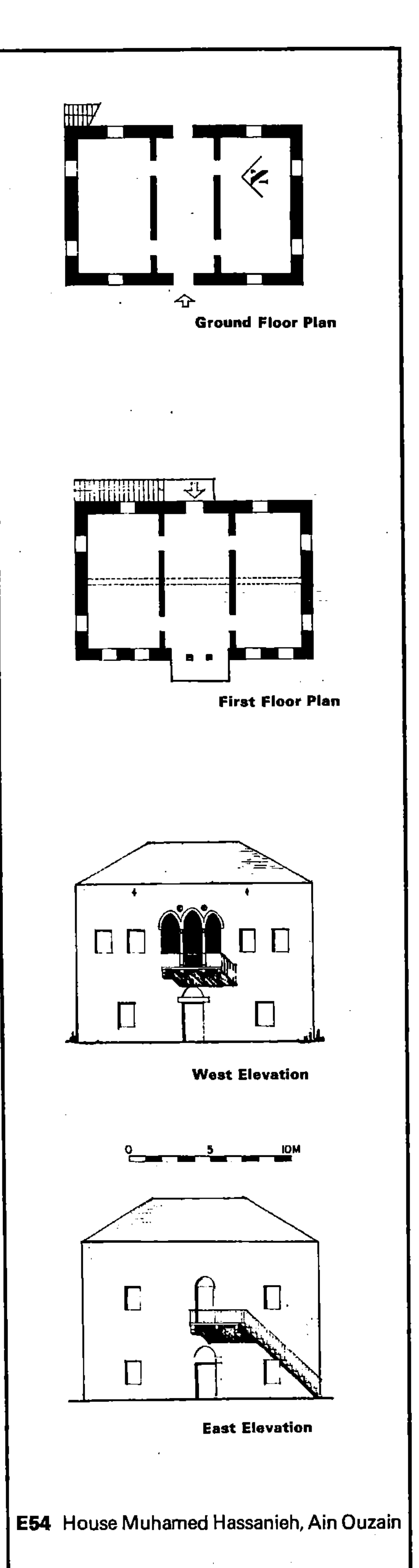
E51 House Najm Abu Haidar, Damour



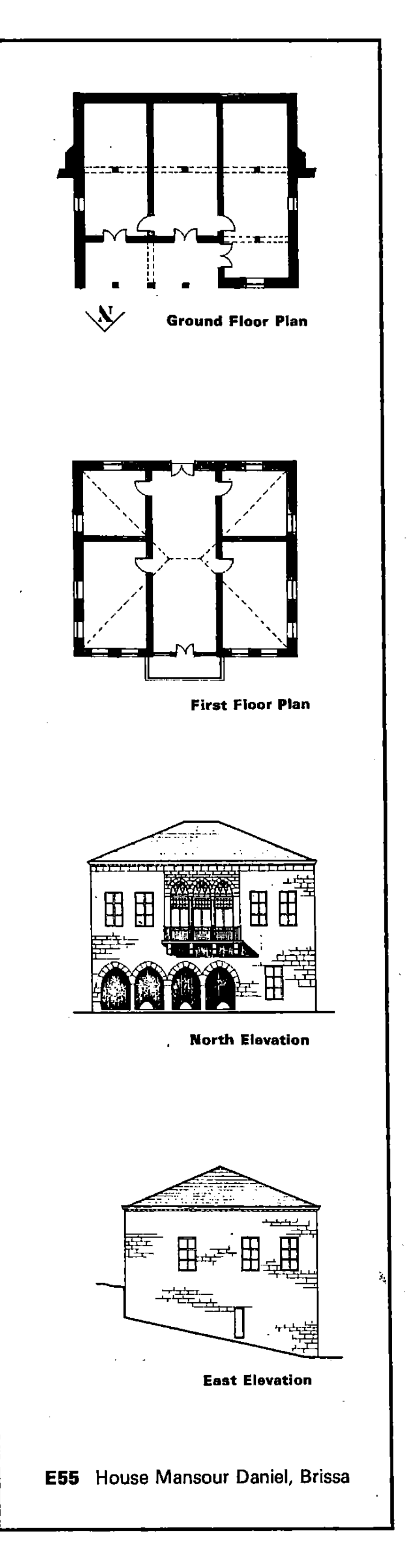
E52 House Fouad Chamoun, Deir el-Qam



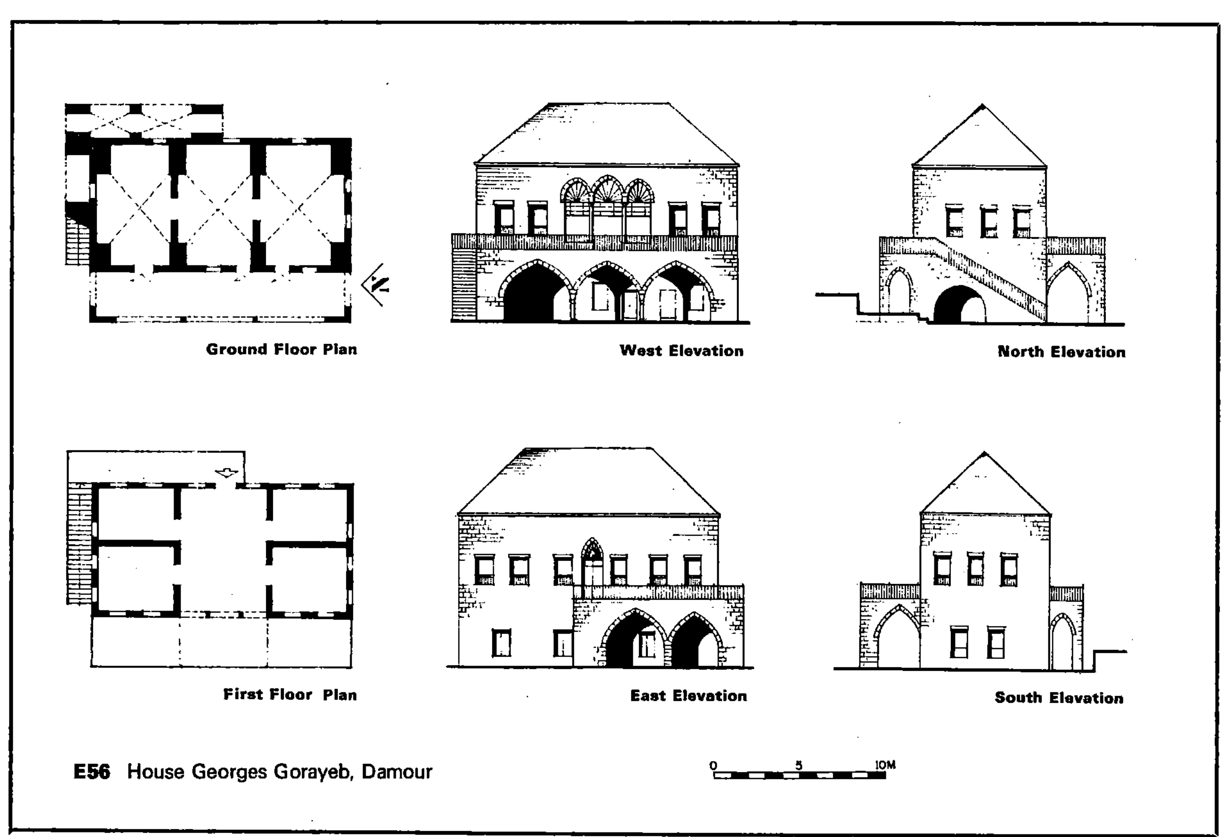
E53 House Youssef Amin, Boutme



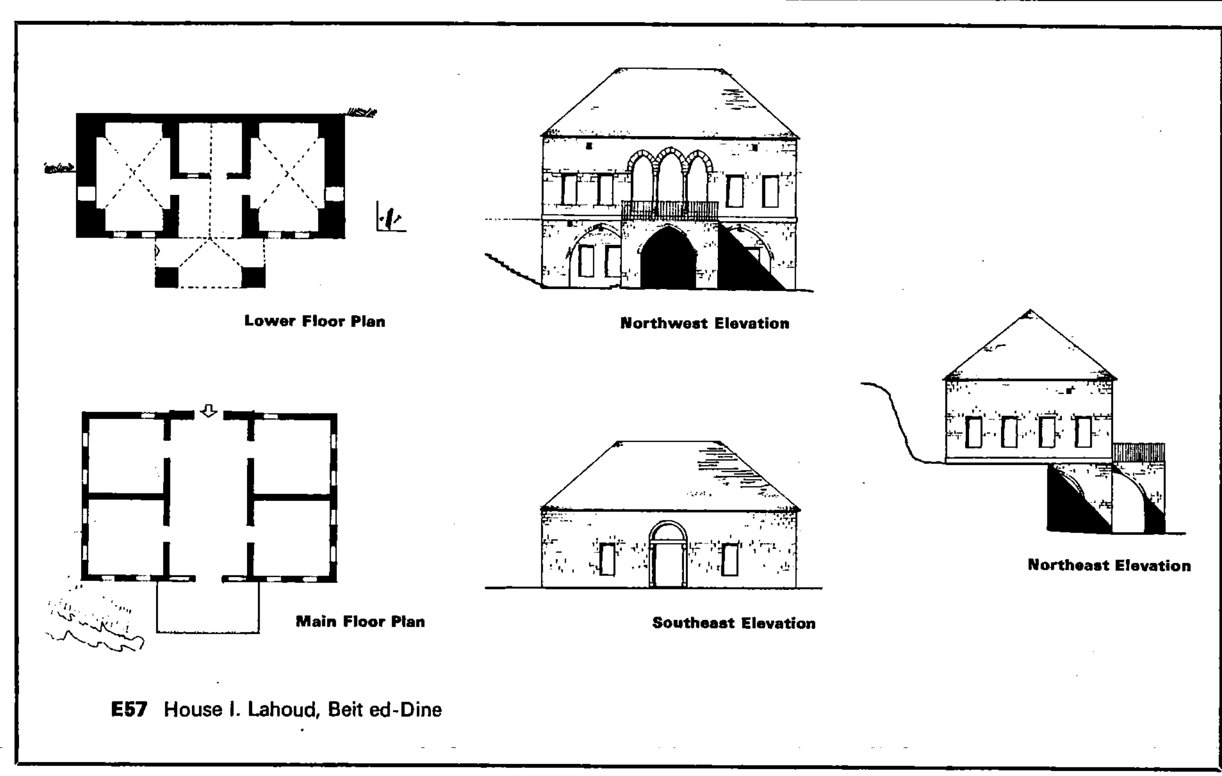
E54 House Muhamed Hassanieh, Ain Ouzain



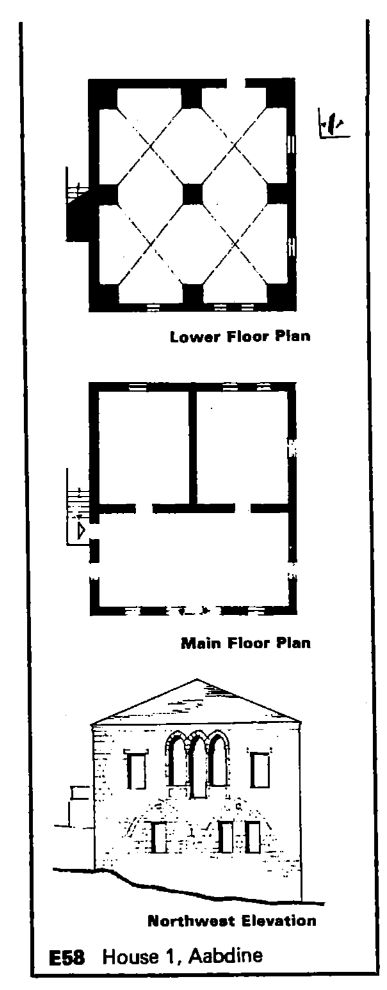
E55 House Mansour Daniel, Brissa



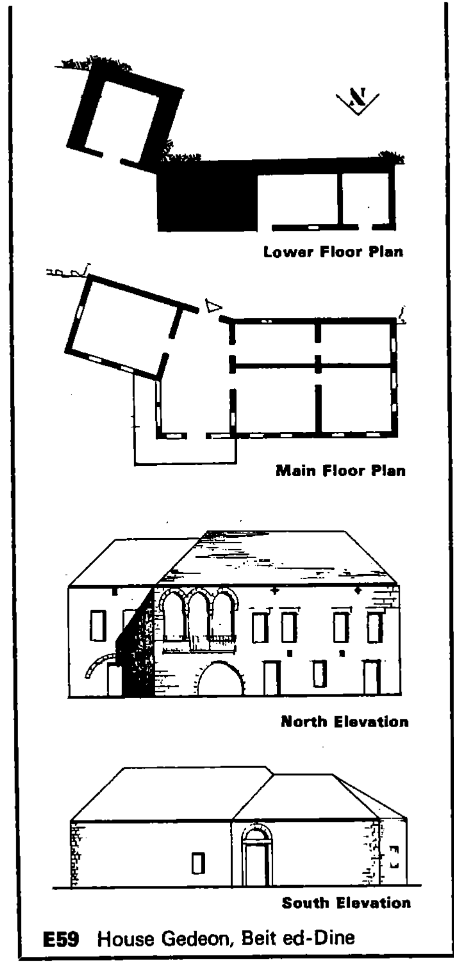
E56 House Georges Gorayeb, Damour



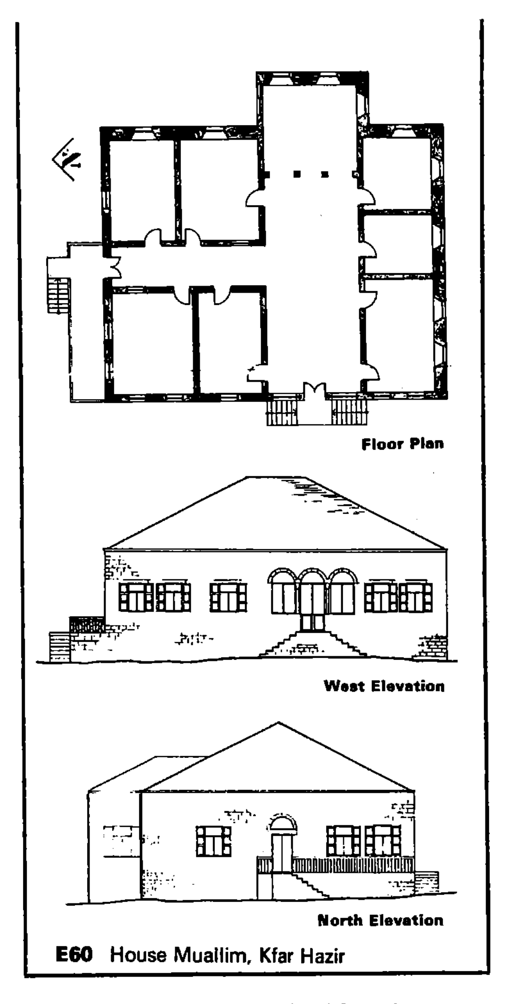
E57 House I. Lahoud, Beit ed-Dine



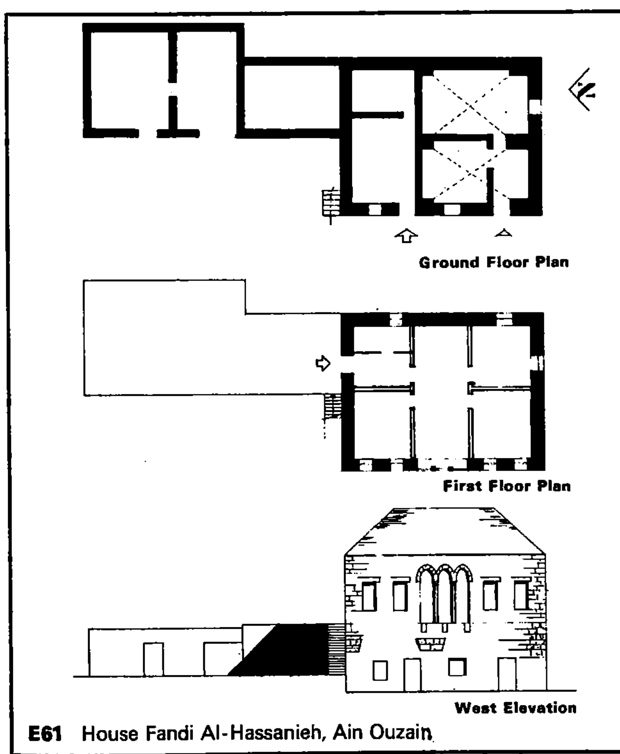
E58 House 1, Aabdine



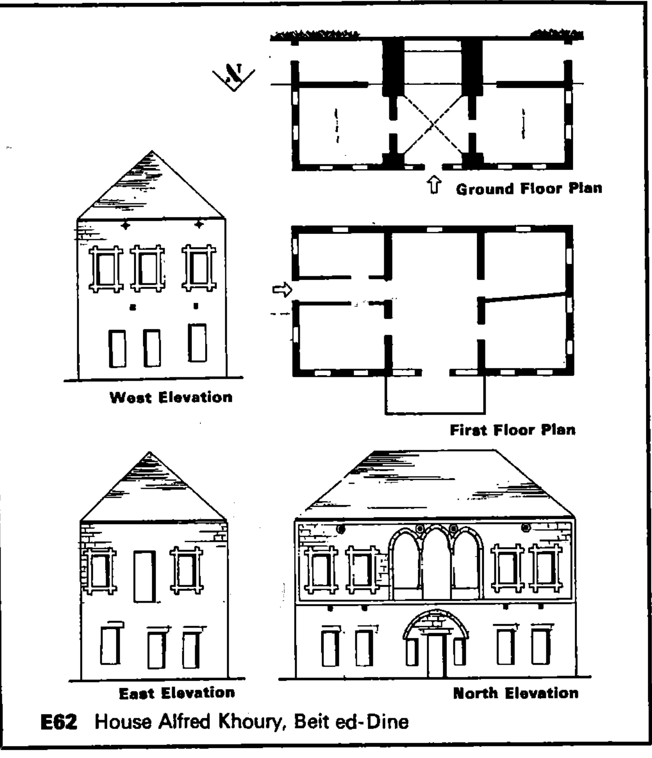
E59 House Gedeon, Beit ed-Dine



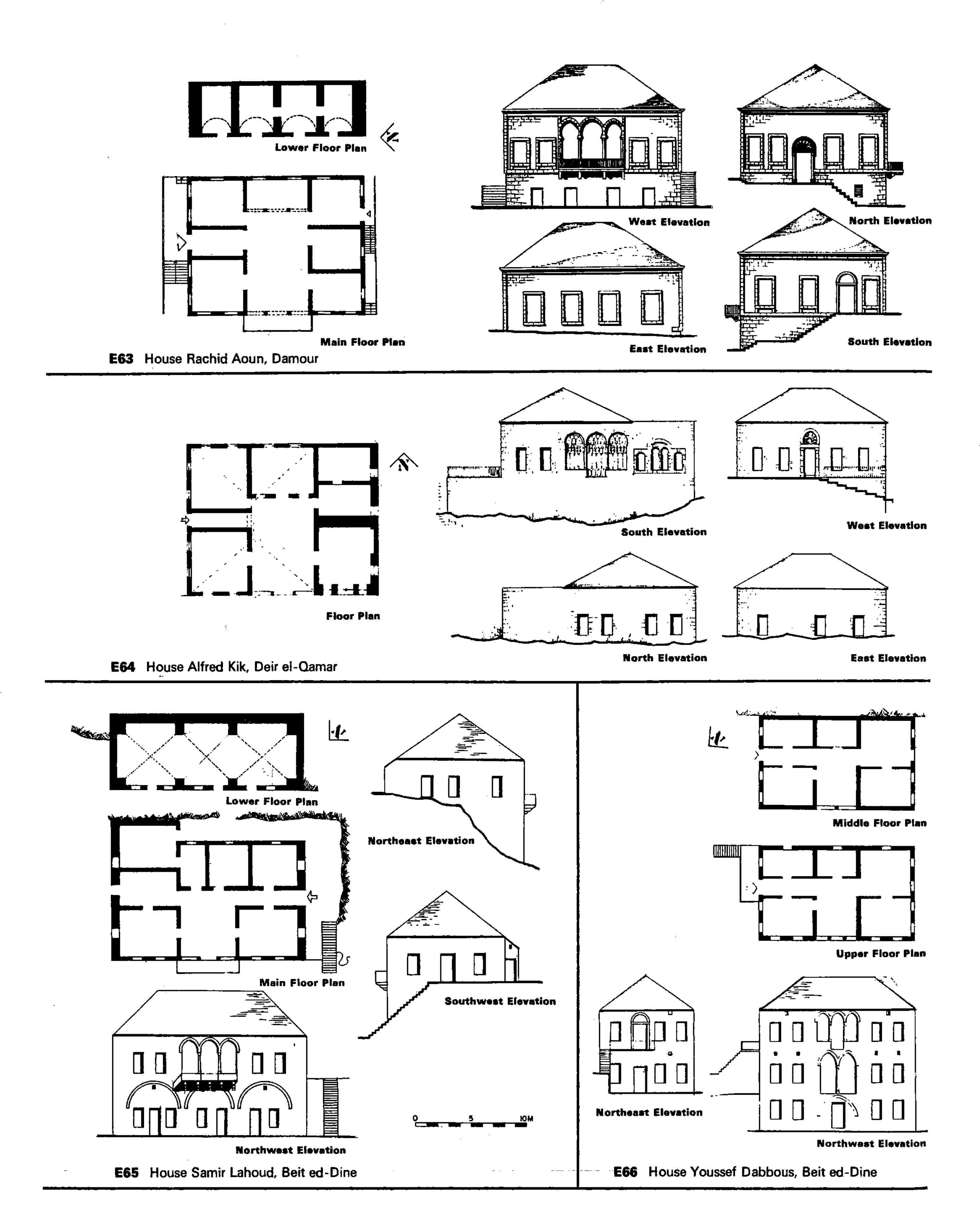
E60 House Muallim, Kfar Hazir



E61 House Fandi Al-Hassanieh, Ain Ouzain



E62 House Alfred Khoury, Beit ed-Dine

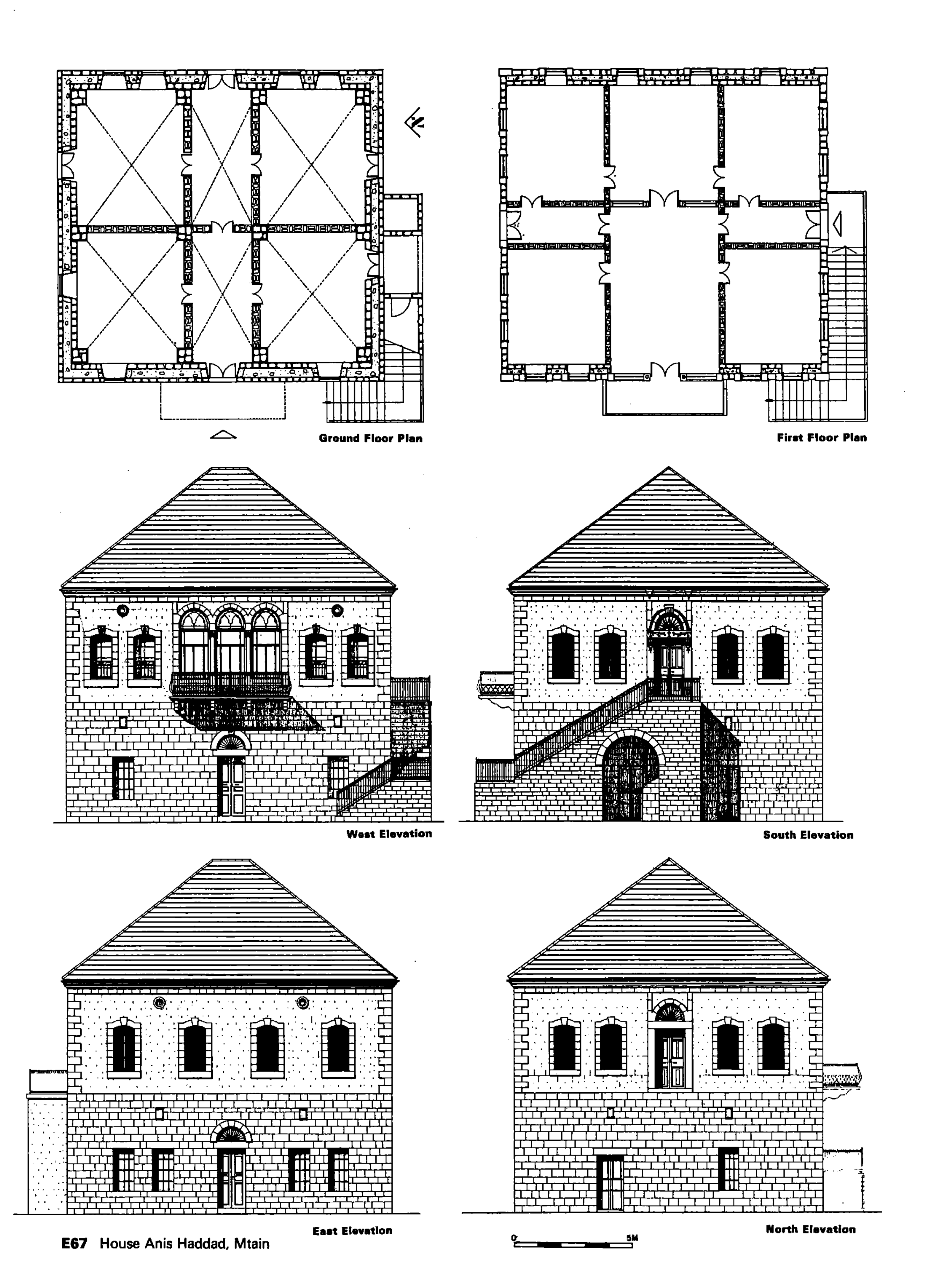


E63 House Rachid Aoun, Damour

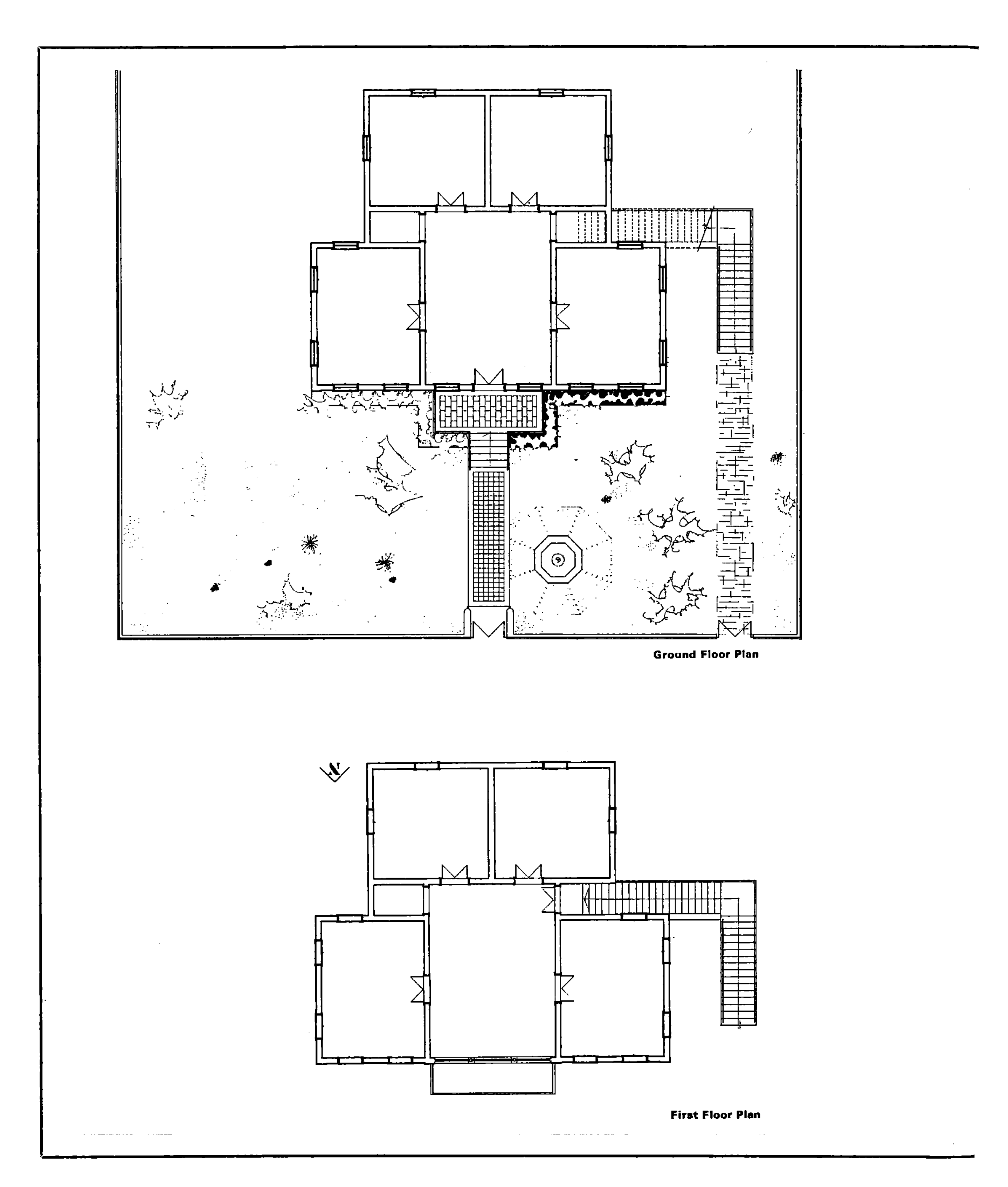
E64 House Alfred Kik, Deir el-Qamar

E65 House Samir Lahoud, Beit ed-Dine

E66 House Youssef Dabbous, Beit ed-Dine

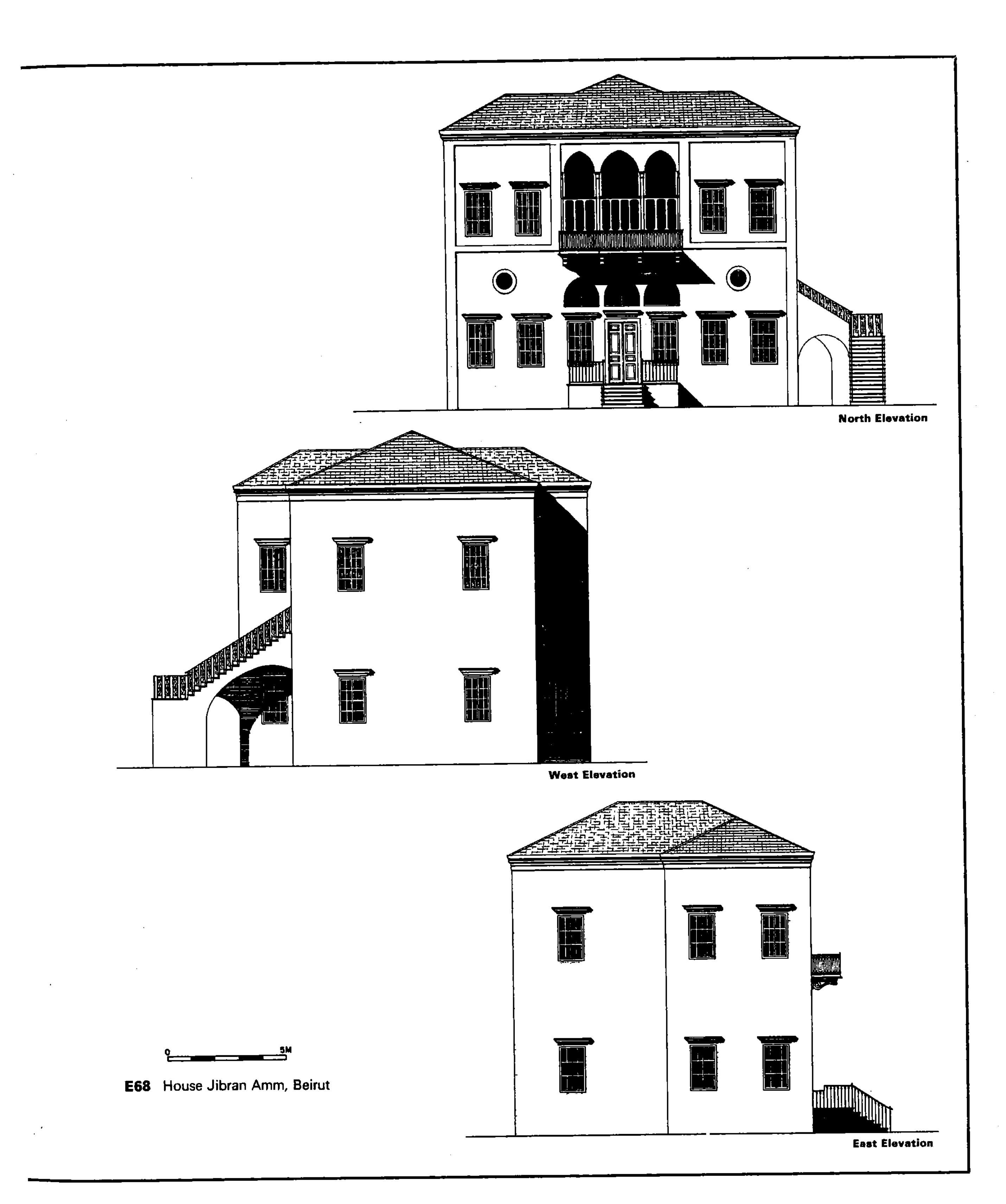


E67 House Anis Haddad, Mtain

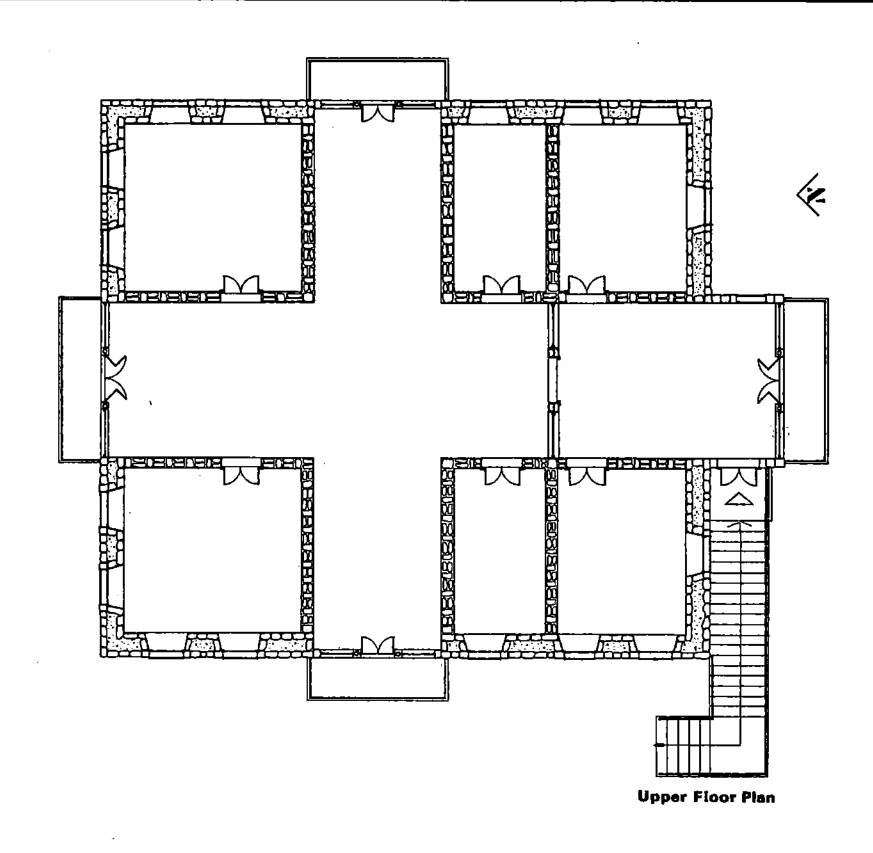


Ground Floor Plan

First Floor Plan



E68 House Jibran Amm, Beirut

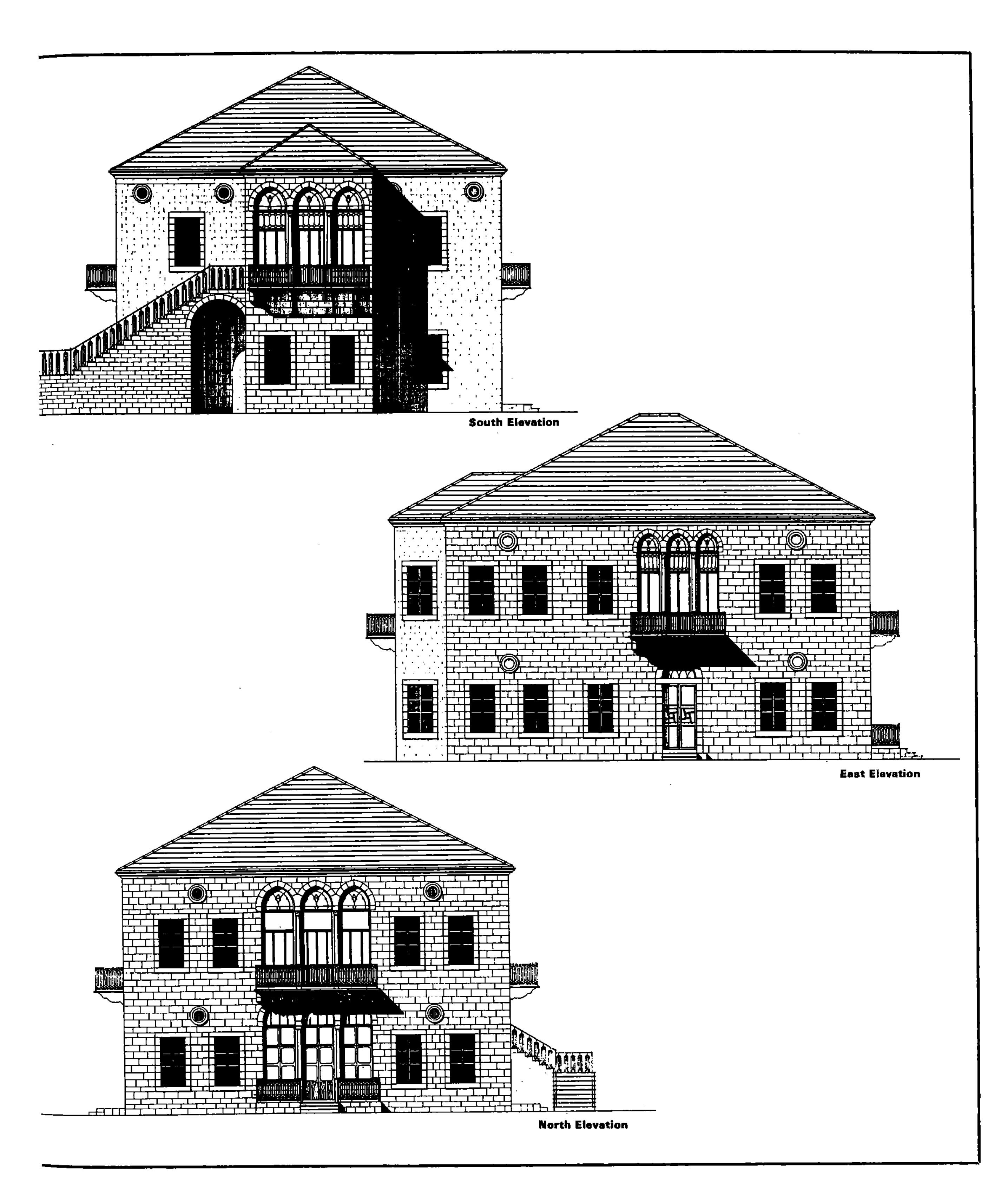


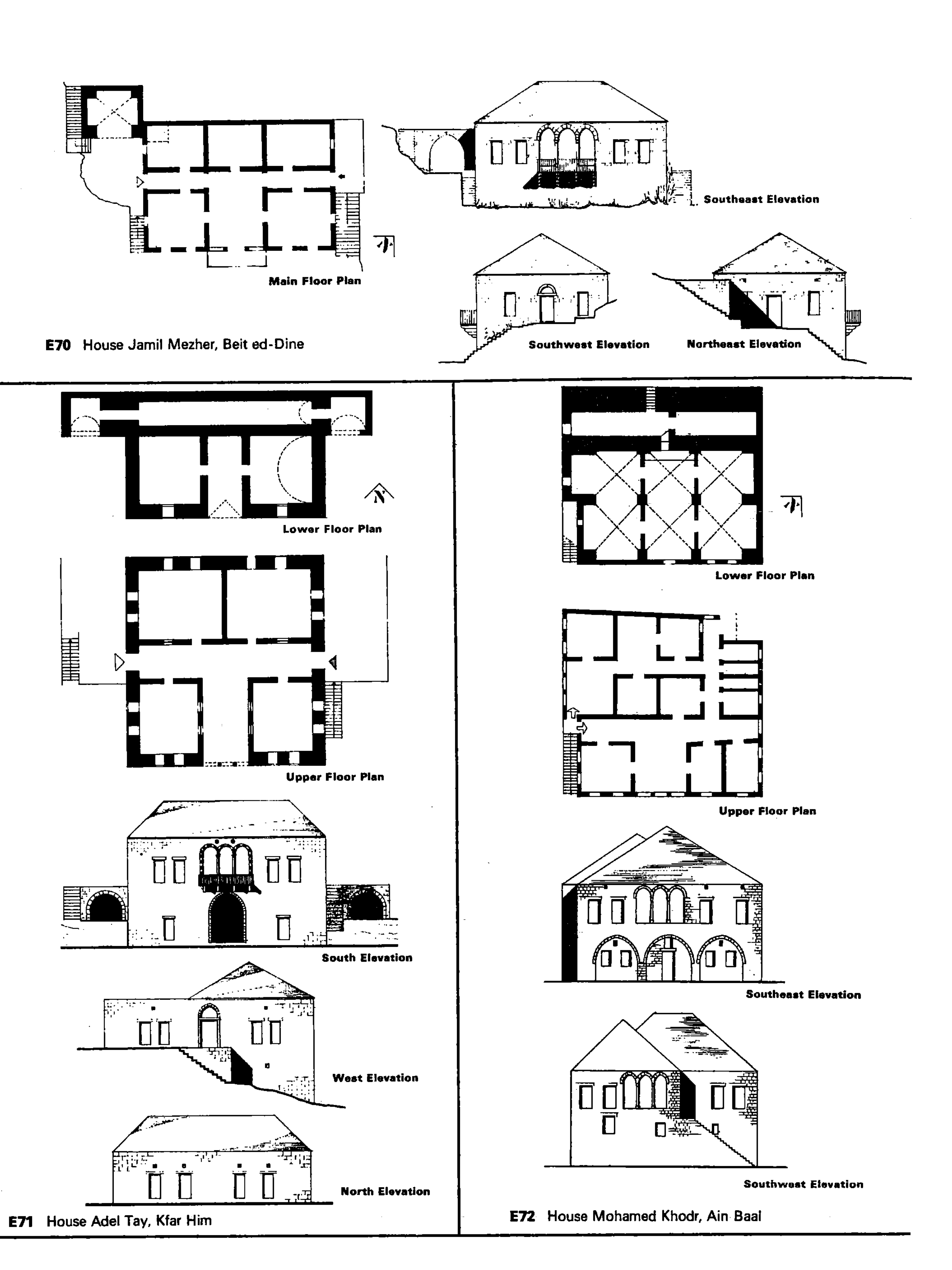
Upper Floor Plan



West Elevation

E69 House Hanna Shikhani, Bikfaya

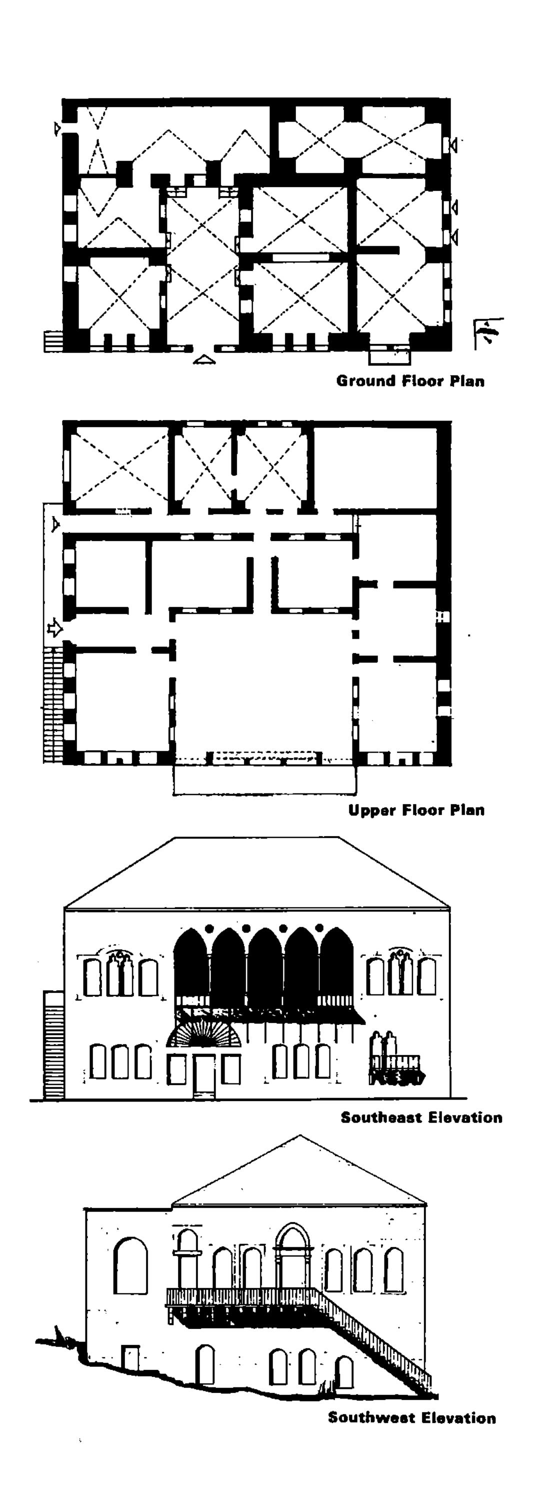

South Elevation
East Elevation
North Elevation



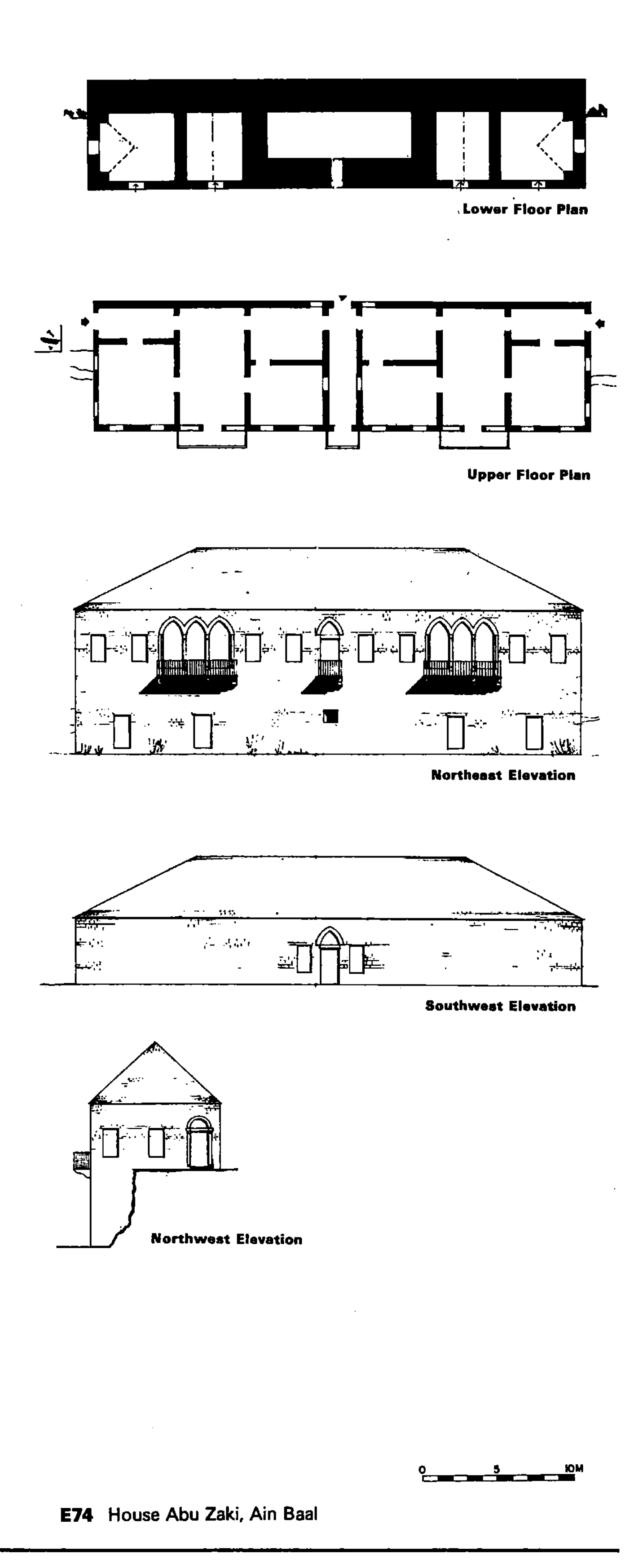
E70 House Jamil Mezher, Beit ed-Dine

E71 House Adel Tay, Kfar Him

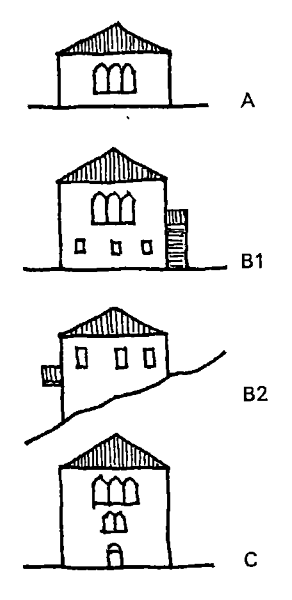
E72 House Mohamed Khodr, Ain Baal

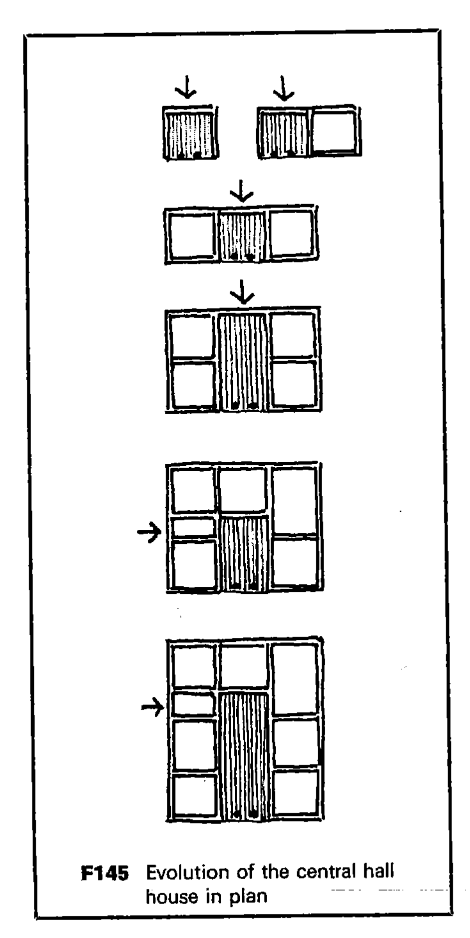


E73 House Kamal Halim Jumblat, Moukhtara



E74 House Abu Zaki, Ain Baal





F145 Evolution of the central hall house in plan

Another system would be to arrange the examples according to the number of floors:

A. Single floor houses with central hall (11 %), E60, E64, E70. All slightly raised and with side entrance. E60 can be entered through the arcade.

B. Two-storey houses with central hall (81 %), E48-59, E61-63, E65, E67-69, E71-74.
Of these

1. On flat site, upper floor is reached by an external stairway or through an annex (40.5 %).
2. On sloping site, upper floor directly entered from the hillside (40.5 %).

C. Three-storey houses with central hall (8 %) (E52, E66, both on a slope).

Regarding the arcade of the central hall, we see that two of the twenty-seven examples have two arches (7 %); twenty-four have three arches (88 %); and one has five arches (4 %).

Therefore, we may summarize the following characteristics of the most common mode of the central-hall house:

1. It has a triple arcade (88 %).
2. It consists of two floors (81 %).
3. It has one single entrance to the main floor (81 %), which usually leads directly into the central hall from the rear (41 %), or reaches the hall from the side through a corridor (33 %).
4. It is built on a slope into which the rear part of the lower floor backs (59 %).

Looking at the plans we notice their predominantly symmetrical composition (85 %). Those with a middle entrance at the back of the house are fully symmetrical, while the symmetry of the plans with lateral access is disturbed by the corridor to the hall. The quest for full symmetry leads to complementary corridors in later examples (E67, E68). The application of two side entrances opposite to each other re-establishes complete symmetry (E70, E71). In this way we have a main and a secondary (service) entrance.

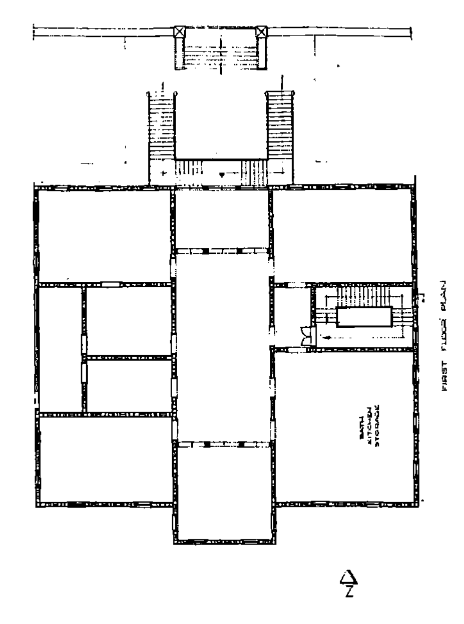
The central hall scheme does not permit access through the arcade of the hall. Only in subsequent urban models, when a central hall is also placed on the ground floor, are there entrances through the triple arcade (E67, F147).

If we take the central hall as the nucleus, we can add one to seven rooms to it (F145). In fact, one finds all stages of completion or extension (F146). If a larger number of rooms is needed, additional wings may be attached by means of intermediary corridors (E73); the combination of two central

hall groups is rare (E72, E74). It may occur in extended families, but as a rule each generation builds its own house (comp. page 101). The rooms themselves are predominantly square to rectangular in plan, their smallest measurement is rarely less than 4 m. and the area is generally about 20 m^2. The width of a central hall with two arches reaches 3,5 m. (E48); when three arches are employed, a third of the examples are 4 m. wide, one-fifth are 5 m., and two-sixths measure respectively 4,5 and 5,5 m. in width. Sometimes the width may be as little as 3 m. (E61), or it may be as much as 6 m. (E52). There are also houses with four and even five arches (E73, F248). In example E73 the width of the hall is as much as 10 m. The length of the halls vary from 3,5 m. (E48) to 12 m. (E55). Long halls usually have an additional interior arcade (E60, E63, E67).



F146 Salima



F147 House Michel Khouri, Beirut

Towards the end of the nineteenth century, when western influence began to be felt, the central hall scheme was adopted as the most widely used plan, and the design became increasingly formal. The houses turn into veritable villas (*ḥārāt*, pl. of *ḥāra*), which are majestically dominating their surroundings. In towns the villa principle of siting was introduced, placing the building in the middle of the lot and considering all elevations as having more or less equal importance. The existence in traditional Lebanese architecture of a detached multi-level house, namely the house with central hall, offered at this stage an opportunity to maintain a local model under western siting conditions. This explains the flourishing of the central hall scheme until well after World War I. Countries that had previously built in the cluster fashion, grouping houses around open spaces, had to turn to imported western models at this stage for their villa designs.

In towns the ground floor is also used as a dwelling. Each floor is usually an independent apartment, the upper storeys being reached by an external stairway. A typical example is E68, which dates from the second half of the nineteenth century. The rigidly symmetrical plan included kitchen and toilet.

In rural areas these amenities were still lacking (E67). Here the ground floor also retained its closed character, even when used for living purposes. Toilets were placed in the garden, and washing was done with buckets and pitchers.

The upper floor of example E69 has a remarkable plan. Two central halls are placed athwart each other, producing a triple arcade on all sides of the building. The slightly projecting southern hall serves as entry; the actual central space consists of three arms. Every elevation has a balcony, which makes for a strong relation to the surroundings. This plan is a logical variation of the examples with entrances on both sides (E70, E71). Example 73 shows the

enlargement of the hall to a width of five arches. It is a monumentalization of the common scheme by a leading Druze family.

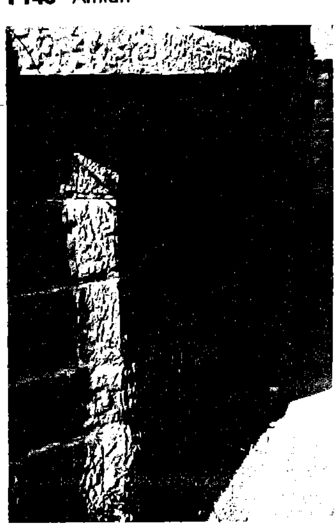
Finally, example 74 shows the combining of two identical houses. A common middle entrance and two secondary doors provide access to the building. The house was built for the families of two brothers.

Ease of construction and planning, tradition and climate may explain the persistence of the open air staircases. It was only at the end of the nineteenth century, and certainly because of western influence, that the staircase was moved inside (F147).

B. CONSTRUCTION



F148 Amiun



F149 Amatour

WITH FEW EXCEPTIONS the central hall house is built of stone. As a rule the lower floor is vaulted while the upper floor has a roof frame of timber with red tiles. In the simplest example the lower floor also has a timber ceiling, either without (E48) or with (E51) supporting arches. For vaulting, barrel or groin vaults are used, depending on the shape of the room. The vaults generally have a pointed cross-section; cloister or ribbed vaults are not used. Full basements are very rare, while half-basements are frequent; on hillsides the lower floor extends sometimes only halfway through the building, while the rear half or the upper floor rests directly on the ground.

The top floor with the central hall is never vaulted, since vaulting would render the whole top floor construction very heavy and expensive. Only seldom does it have a flat timber-earth roof, because the usual 4 m. width of the hall stretches the spanning limit of such construction. In the great majority of cases we find hip roofs, consisting of a cut-timber framework with red tiles.

The new light-weight roof construction brought important structural advantages; in a sense, it was this innovation that sparked off the widespread adoption of the central hall house. The reduction of the roofload allowed thinner walls for the upper floor, and the large ceilings of the central halls no longer presented a problem. The ceiling is normally carried by the bottom chords of the roof trusses and consists either of wooden sheathing or of woodlath and plaster. Both techniques lend themselves to decorative treatment, which is applied to the extent that funds permit. In houses the length of which does not exceed 8 m. the roof trusses may rest on the exterior walls only, leaving the partition walls nonbearing. This method, in combination with solid vaulting below, simplifies the remodeling of such floors today. In larger buildings the roof is also supported by the interior walls. The ceiling under the roof is seldom strong enough to be walked upon, and the attic is never used for living purposes and dormer windows are unknown.

The straightforward symmetry of the plans simplifies the structural design of the houses. Sometimes, however, the rectangular plan of a house conflicts with the irregular shape of a lot. In such cases projecting corbels are used as a transition from the irregular ground floor to the regular upper floor (E52 west elevation, F148, F149.

A technical speciality is the choice of stone for the exterior walls according to its exposure to the weather. In Baskinta for instance, there are several houses where dense limestone is used for the elevation exposed to the winter rains, while the other elevations are built of softer sandstone. Similarly, in buildings made of sandstone, parts such as lintels, jambs, consoles or arches which receive special loads are made of limestone. The contrasting colors thus make for a pleasing decorative effect (F150).



F150 Qnat

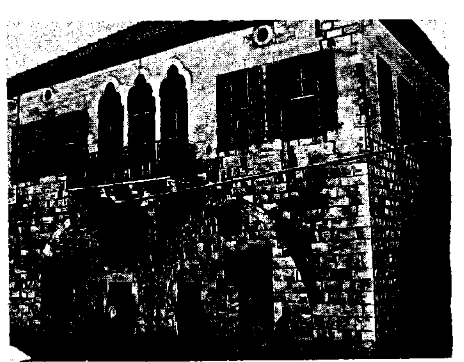
C. EXTERIOR DESIGN

We can easily recognize the central-hall house from the outside, since the hall is always well expressed in the facade. The building is generally a clearcut, simple cube, where all four facades read well. Naturally, the elevation with the striking triple-arch motif of the central hall is dominant (F150). As a rule, this elevation is symmetrically designed and the windows of the lateral rooms are plain rectangular openings, deliberately kept secondary to the triple-arch. In this way the contrast between arcade and wall surface is maintained, and the sequence of mass-void-mass gives an impression of stateliness and secure possession (F151).

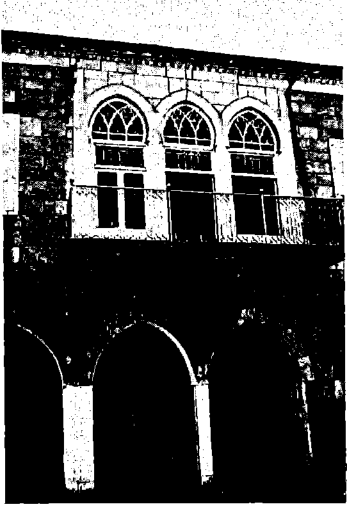
In contrast, the other elevations have normal windows in plain rectangular frames, usually with wooden shutters opening out. The entrance is very modest as a rule, consisting of a rectangular door with relieving arch above the lintel.

The exterior walls are always built in ashlar masonry, rock or pitch faced with a 2 cm. tooled margin and joints of only a few millimeters. Usually the three arches of the hall project by 0.5-1 cm. and have a crandalled or bush-hammered finish. Sometimes the arcade is emphasized through the use of differently colored stone (F152).

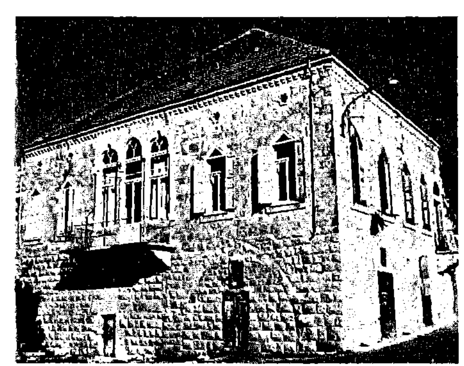
The triple arch is usually composed of a door in the middle and a window on each side. Originally, these apertures were not glazed — the hall was open. It is only during the last hundred years that glazing has become common. The frames are of wood and the panes are often subdivided in elaborate decorative patterns. The arcade generally reaches almost to the ceiling, and has a balcony with a wrought-iron railing in front. The balcony slab consists of stone (marble) slabs, about 5 cm. thick, and rests upon stone corbels (F148). The windows of the rooms originally had wooden shutters (*darfe*) only; today these are supplemented by glazed wooden sashes on the inside.

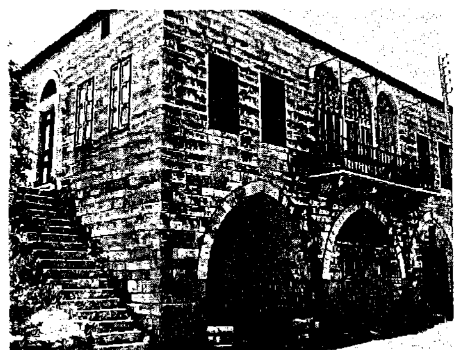


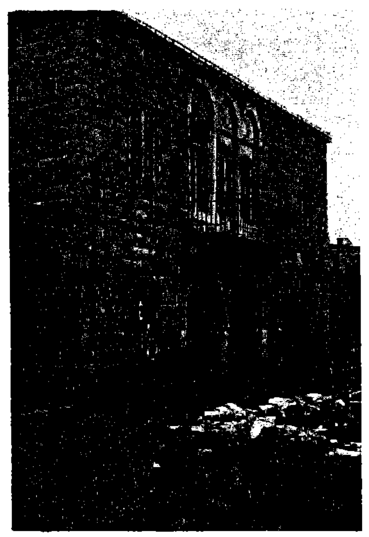
F151 Amiun



F152 Brissa


F153 Ehden


F154 Beit ed-Dine


F155 Beskinta

More articulated facades have the lower floor built in rock-face masonry, while the upper floor has a smoother finish, possibly with quoins expressed at the corners (E68). Furthermore, individual windows or groups of windows may be framed by finely finished wall panels, which are sometimes carried around the corners or developed into patterns of projecting bands (E62, E63). In the late phase of development the windows receive pediments (F153). In the cities plaster finish was introduced at the turn of the century, mainly in order to allow the use of the porous local sandstone (E67). In contrast to the generally symmetric distribution of openings on the upper floors, the bottom floor remains relatively closed with doors and windows placed at random. Quite frequently some of the ground floor vaults are left entirely open to serve as covered work or storage spaces (F154).

A beautiful combination is achieved by putting a central hall floor on top of a liwan unit (E51, E71). Normally this is the result of later enlargement. Instead of a liwan we may also find a gallery on the ground floor, particularly in the case of roadside locations (E55, F155, F156).

Sometimes the enlargement of the balcony is desired. Since stone corbels cannot easily exceed 2 m. in projection, galleries or vaults are also used for this purpose (E57).

Like the types of houses described in the previous chapters, the elevations of the central hall house are derived from the internal arrangement of rooms. However, this type of house became so standardized, and was so frequently used until well after World War I, that in its elevation we can discern clearly the evolution of architectural forms from the middle of the nineteenth century onward.

As is common in stylistic development, the design evolves from simplicity to elaboration, from natural spontaneity to self-conscious artificiality. As mentioned previously, the triple arch motif derived its effect from the contrasting neutrality of the whole facade. As soon as additional forms are appended, conflict becomes inevitable. Already deviation from the simple rectangular shape of windows can disturb the composition (E52 south elevation). On the other hand, with increasing affluence the owner demanded a corresponding enrichment in the outward appearance of the house. Fortunately, this was a slow process. In the beginning it took the form of gradually increased refinement in masonry work until the outer edges of the blocks were cut with such precision that visible mortar joints were practically eliminated. The smooth surface finish of the stones was at first limited to arches and frames of windows and doors; later on it was extended over the entire main floor (E68). Little by little the various parts of the arcade also received additional decoration, the pointed arch being complemented by trifoil arches

(F153, F151), ventilation openings were filled with intricate patterns (F153), window surroundings became more emphasized.

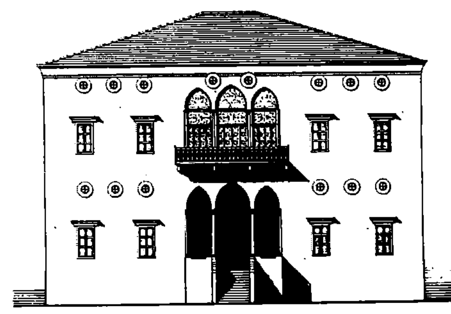
A comparison of E69 with E67 demonstrates the increasing articulation of individual elements in the facade. In E69 all parts are still fully imbedded in, and secondary to, the dominating masonry wall. Apertures seem voids in a solid mass. The proportions are pleasant and the asymmetrical elevations are also well balanced. An equal harmony reigns in E67, but ground (secondary) floor and upper (main) floor are clearly distinguished by the difference in stone finish and the prominence of the windows. Quoins are carried up at the corners; the window lintels on the main floor are slightly curved and feature accentuated key stones.

In some cases such additions are agreeably accomplished, in other examples, however, they may be as disturbing as, for instance, the mannerist window frames of examples E62 and E63. A similar comparison may be made between the quiet restraint of F157 and the north elevation of E68, which has degenerated into artificial subdivisions, oversized bull's-eyes and a number of competing elements which seriously challenge the unity of the elevation.

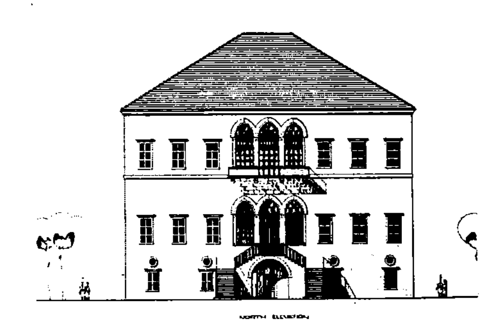
Another form of western influence towards the end of the nineteenth century is apparent in F158 where the plain extrados of the arches in the Arabic tradition are replaced by vigorous hood molds closer to Gothic models. Nevertheless, the expressive value of the triple arcade is strong enough to maintain the Lebanese character, even in facades with extensively westernized detailing, such as stylized corner pilasters, triangular pediments and articulated hood molds (F159).



F156 From E55



F157 House Trad, Beirut



F158 House Michel Khouri, Beirut



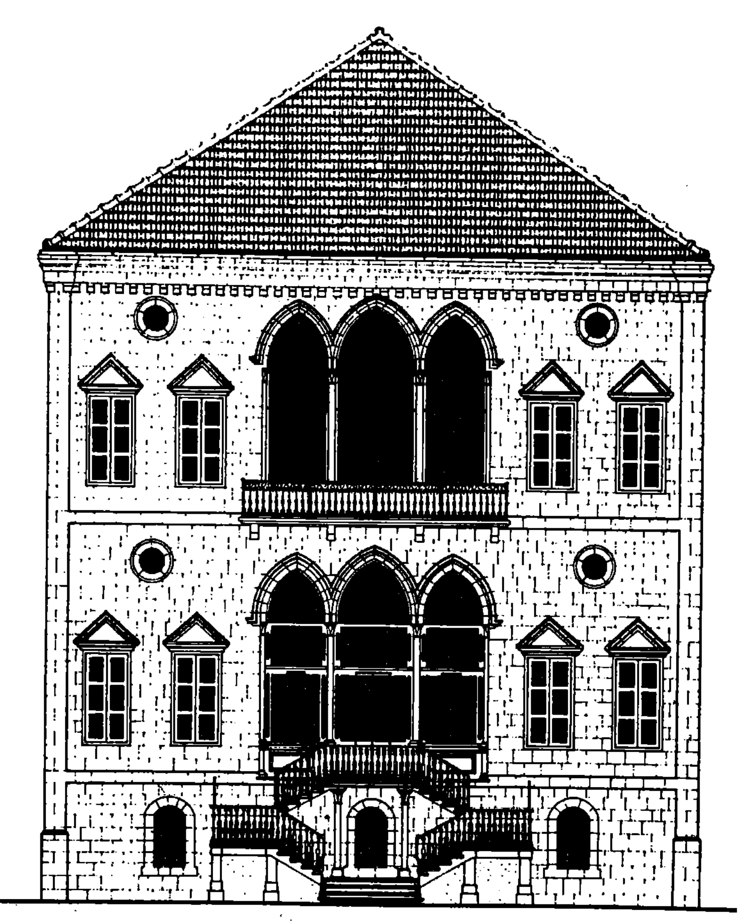
F160 Nahr el-Kelb



F161 Bazyoun

The central hall house is almost invariably covered by a red tile roof. Only very rarely do we see a flat roof, sometimes covered with vines during the summer (F160). In all cases the roof is of tent or hip shape, without dormers or chimneys. It harmonizes agreeably with the simple cube of the building, and its vivid red color enhances the appearance of settlements in the green landscape. The combination of triple arch and tent roof is so striking in appearance and so characteristic of Lebanon that it has an almost symbolic value for the country, furnishing an important theme in graphics and painting.

A curiosity are the small garrets on the apex of some roofs, which supposedly serve as outlooks (F161). Speaking of roofs, it should be added that the strikingly visible red tile roof was not only the result of technical improvement but also had a strong attraction as a status symbol for those who could afford it.



F159 House Zabouni, Beirut (demolished)



F162 Maameltein



F163 House Itani, Beirut

D. INTERIOR DESIGN

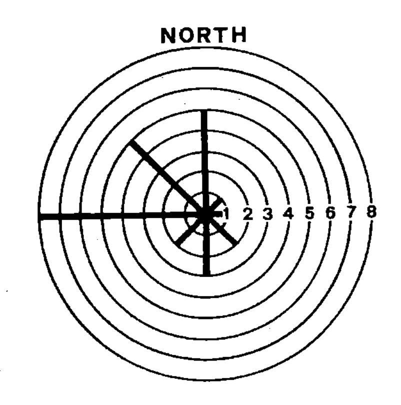
FROM THE OUTSET the two-storey design of the central hall house insures the separation of service and living floors in the countryside. The vaulted ground-floor, of which the rear part is often below ground, offers cool storage space, is usually accessible from three sides, and can easily be used for all kinds of work or as a stable. As the need arises vaults are left open or closed off by walls. Originally, the lower level also accommodated cooking and washing facilities, sometimes also the servant's quarters.

Frequently the liwan unit is found on the ground floor, the liwan serving as work space and the rooms for storage (E51). Ground floor galleries with shops behind are found lining streets (F162) and today the ground floor is often used for living in. In the city version of the central hall house the ground floor may become a self-contained apartment (E69, E73, F157-159).

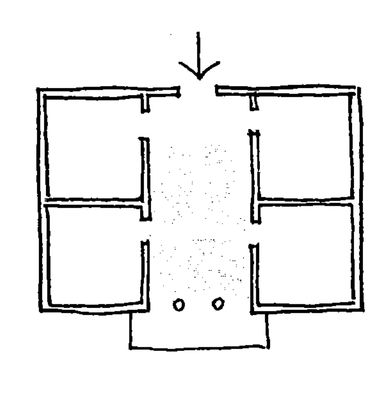
The main floor centers around the hall in the middle, which is seldom less than 40 m² in area, and from 4 to 5 m. high. This substantial volume is effectively expressed on the outside by the wide arcaded opening, which in turn admits plenty of light to the hall. The charming view through the arches is often embellished by decorative stained glass designs (F163).

The central hall is called *dār,* which basically means home, and is here the most important room of the house. Sometimes also the term *ma''ad* is used, meaning seat. The concept of the central hall with the triple-arch motif demonstrates in several ways the special position of Lebanon in the Arab area:

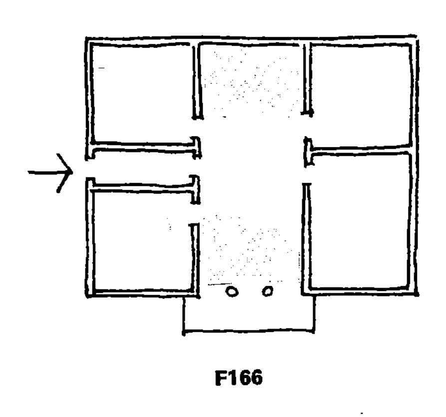
1. CLIMATE: The hall, being open towards the valley, receives the breeze entering the valley from the sea. Drafts can be controlled by the manipulation of doors and windows.



F164 Orientation diagram for the 27 examples of central hall houses



F165



F166

2. TOPOGRAPHY: The hall opens to the view, and makes the environment a natural extension of the interior. An analysis of the orientation of the twenty-seven examples shows that west-north-west is the most frequent exposure (F164). This corresponds to the view towards the sea (F1).
3. SOCIOLOGY: Lebanese society is based upon the clan-structure, but the extended family is the social unit, regardless of residence. In fact, Gulick's findings indicate that the Lebanese prefer living as independent conjugal families in order to avoid *hamahkinnah* trouble, or conflicts which common residence with inlaws may cause.[35] The majority of houses are therefore designed for nuclear families, in which case the number of rooms that can be placed on both sides of the hall is sufficient for the dweller's needs. The Lebanese could afford to live in nuclear families because of their economic independence and egalitarian way of life. In a sense we may even speak of a farming middle class in the mountains. Life in small families only seems to have strengthened the bonds with the extended family and mutual hospitality is of immense importance. It may also have influenced the attitude towards the strict separation of sexes, which is not practiced among the Christians and Druzes at all and among Moslems in Lebanon only to a very limited extent.

The central hall, then, furnished the desired main space for family and kinship. There are parallels to contemporary multi-purpose spaces, which serve various aspects of family life as well as distributors to adjacent rooms. Behind the entrance in the middle of the rear wall, there is first a traffic zone, then a small sitting or study space between the doors to the rooms, and finally the large sitting area next to the arcade extending, if necessary, out onto the balcony or terrace (F165).

When the entrance is at the side we gain two dead-end zones in the hall. The rear is then frequently used for dining (F166), and is separated from the front part of the hall by an interior arcade.

The size of such a single floor apartment varies between roughly 100 and 300 m², the majority of floors averaging 140 to 200 m². In addition there are the mezzanine areas, which are usually above the kitchen and pantry, since they are used for servants' accommodation and storage.

As in the other types of houses, the problems of food preparation, washing, toilet and heating, are treated as secondary and by contemporary standards are not solved at all. In the congested oriental cities of old times much more attention had to be given to these matters. However, the prevailing rural environment in Lebanon, together with the favourable climate and the usual detached settlement pattern,

eliminated problems of sewage disposal and central water supply. Cooking is simplified by eating habits which favour fresh vegetables, baked and grilled foods but avoid complicated cooked dishes. Most of the elaborate menus of today originated in cities such as Aleppo or Cairo. For the Lebanese cuisine, a simple charcoal grill for meats, a charcoal basin for some cooking, frying and the preparation of coffee, and the oven for baking bread suffice. These activities generally take place out of doors. Only in the houses of the late nineteenth century were kitchens definitely installed, if possible on the leeward side of the house.

Stoves or fireplaces for general heating purposes are found only in palaces. In cold periods people huddled round movable clay pots or braziers in order to keep warm.

Since the central hall house either has its independent housekeeping floor and is furnished with auxiliary mezzanine spaces, the inclusion of built-in furniture, silos etc. dropped out of use. There are no more raised platforms, continuous benches or large wall niches, and in this type of house the use of movable furniture was envisaged from the start. The main living room (*dār*) and the salon (*mrabba'*) contain all sorts of furnishing (*farsh*). Richly decorated, low, oriental tables (*ṭāwleh*), divans (*dwāwīn,* pl.of *dīwān*), mirrors (*mrāyāt,* pl. of *mrāyeh*), curtains (*berdāyāt,* pl. of *berdāyeh*), oriental carpets (*sejjādāt,* pl. of *sejjādeh*) and chandeliers (*trayyāt,* pl. of *trayya*) are common. For western style tables and chairs no oriental models existed and that may explain why European furniture was copied from the beginning for such items.

In the spacious bedrooms (*'uwaḍ*) we find beds (*tkhūte,* pl. of *takht*) with mosquito nets (*nāmūsiyyāt,* pl. of *nāmūsiyyeh*) and wooden wardrobes (*khzānāt,* pl. of *khzāneh*). Floors are finished in stone paving (*blāṭ ḥajar*), red tiling (*blāṭ 'armīd*) or are covered with marble slabs (*blāṭ rkhām*).

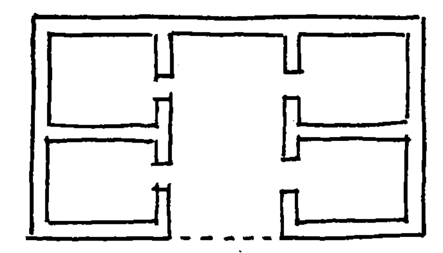
E. ORIGIN

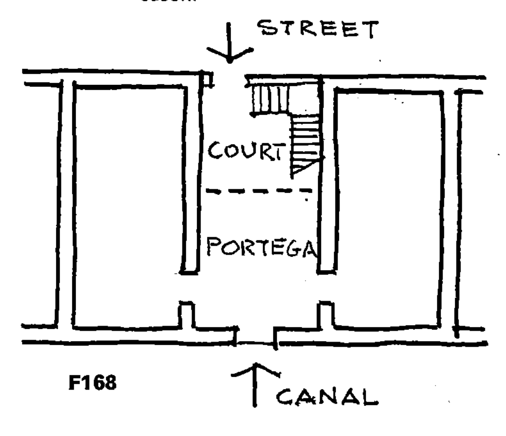
"*Survivance et Migration*"[36] discusses the similarity between the triple-arch motif and Venetian palazzo elevations. The author notes that the grouping of windows in the middle of Venetian facades is very unusual for the quattrocento, and she asks the following questions:

— Is it survival or acceptance of a motif?
— It it a spontaneous invention?
— Is it the decorative application of a structural design?

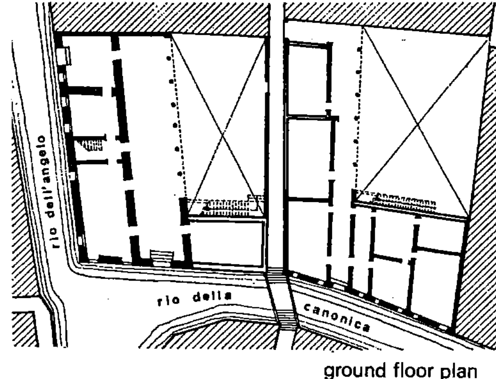
Regarding its relation to a central hall, the writer states that the central hall is unknown in the hinterland of Venice, and therefore this design element must have come from the East, constituting a "*migration de forme*" from East to West.

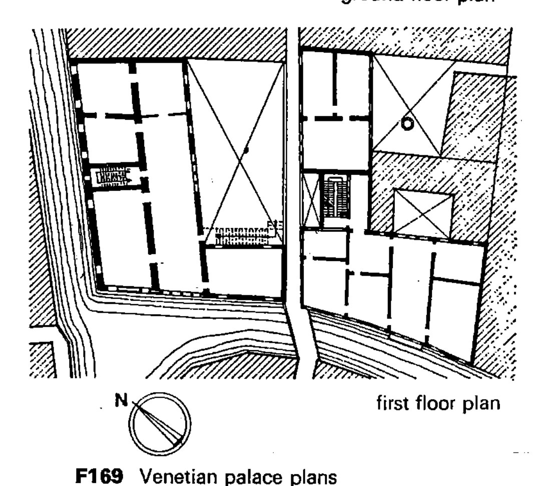
To clarify this problem we must study the origins of Venice and its architecture. From the fifth century, when the


F167 Typical floor plan of a Venetian casoni



F168



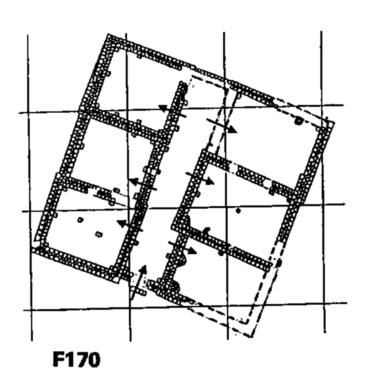


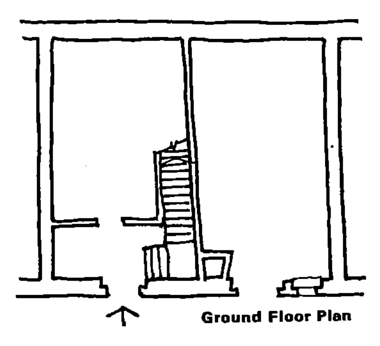
F169 Venetian palace plans

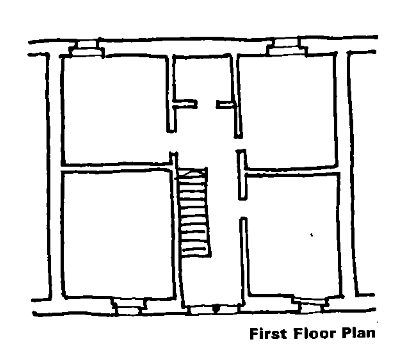
Huns overran Europe, the inhabitants of the northern Adriatic coastland took refuge on the many islands of the lagoon. In 811 the island of Venice became more important owing to the transfer of St. Mark's relics from Alexandria, and soon developed into a powerful city. According to Scattolin,[37] the first dwellings to be built on the islands were made of wooden skeletons with reeds and plaster. These houses were called *casoni,* and are still found around the lagoon of Venice. Their plan is of great interest: an open central hall is flanked by two rooms on each side, one of which contains living quarters, the other stable and storage (F167).[38] In the case of an upper floor the stairway is placed in the rear of the hall. Sometimes the hall is divided into a room in the back, and an open front space, or the hall receives a portico in front.

These plans were suitable for detached houses, usually farms. In a densely built-up town like Venice, however, open space was at a premium, and the most economic way to build was around a small courtyard. A schematic plan typical for the second half of the thirteenth century is given in figure F168. Because of the conditions peculiar to Venice, we have a land-gate and a water-gate. The land-side of the hall is turned into a courtyard, containing the stairway to the upper floor. Since the canal is the main traffic way, visitors and merchants enter through the water-gate; the lower hall is therefore called *portega* or entrance hall, while the upper hall is called *sala* or reception room. Many, though by no means all, Venetian palaces retain this central hall scheme in one form or another (F169).[39] Similar plans are found on the opposite side of the Adriatic coast, in Istria. M. Ferrari describes the Istrian house of the fourteenth and fifteenth century as follows: "The elevation corresponds to a typical distribution of rooms, the *portega* on the ground floor and the *sala* on the upper floor, which stretch the whole depth of the building, and the *mezza* on either side with small windows."[40]

This corresponds very well to the Lebanese central hall house; however, neither elevations nor plans of Venetian and Istrian houses ever attained a degree of standardization comparable to those of Lebanon. The Venetian tendency towards non-symmetrical solutions, the irregular property limits and the purely commercial function of the ground (water) floor, create many variations. In many plans the hall is so narrow that it is reduced to a corridor. The central corridor scheme is a very basic planning principle, and it is not surprising to find it already in pre-classical Byblos houses (F170). In houses with several floors the corridor contains the staircase (F171). Such an arrangement is very common in cooler regions, where the entrance hall with the stairway cannot serve as a living room because of drafts and lack of heating (F172). The central hall could therefore be derived


F170





F171 House Robba-Coreali, Muggia

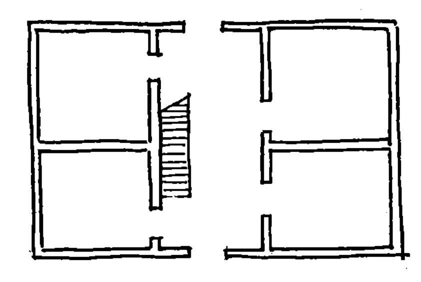
from a simple corridor which was enlarged in response to favourable climatic conditions.

On the other hand, it is known that Venice retained a direct link with its Roman heritage, and it is therefore valid to search for Roman origins for the central hall scheme. It is possible to trace a continuous line of evolution from the atrium to the central hall. The Romans originally called the detached, single-room house with slanting roof *atrium testudinatum.*[41] Light entered through the door, rain was shed to the outside (*atrium displuviatum*) and when additional rooms were attached on the sides, the central hall scheme was obtained (F173). This was the prevailing type of detached house in the countryside all over the Roman empire,[42] and Kalayan gives a similar plan with porch for a Roman house in Baalbek (F174).

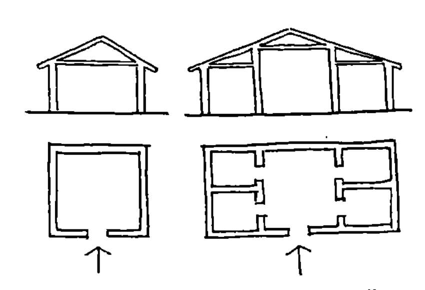
The commonly known Roman atrium house developed from this scheme under crowded city conditions. Since openings to the noisy street were undesirable it had to turn towards the inside; the slope of the roof was inverted and the atrium received a skylight through which the smoke escaped and the water was collected into the impluvium (F175), the resulting space being called *atrium compluviatum.* Rooms were added in front and at the back (*tablinum*) and, by virtue of the open roof in the middle, the atrium became a circulation space rather than the central living room. We can conclude, therefore, that the atrium did not evolve from the courtyard, which was successively surrounded by rooms on all four sides, but rather from a hall which was increasingly opened to the sky.

Contacuzino also discusses this evolution at length and it is interesting to read his observation that "in the Veneto and the Roman Campagna the typical peasant house had a central hall with rooms around and was raised well above ground level to provide a lower storey for utility rooms."[43]

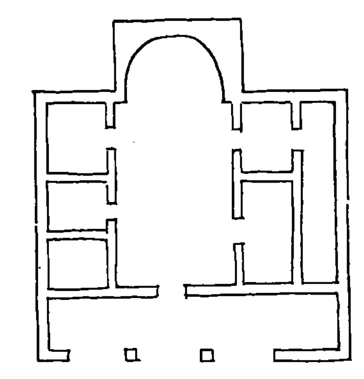
Although we were able to find possible origins of the Venetian sala it is difficult to establish a direct connection between the Venetian sala of the thirteenth to fifteenth century and the Lebanese central hall scheme, which according to the evidence is a late development in Lebanon. Neither



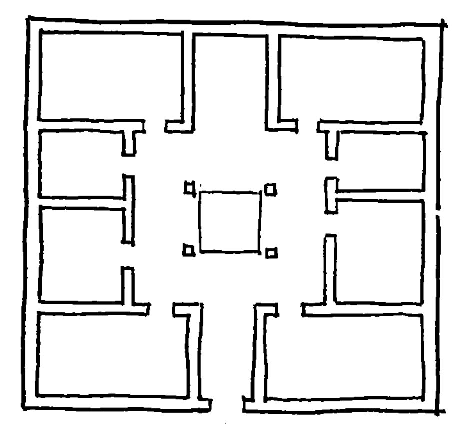
F172 Typical plan of Austrian farm house



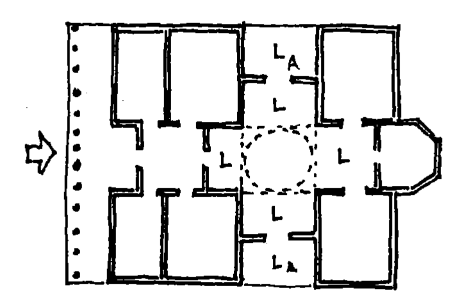
F173 Development of the atrium testudinatum



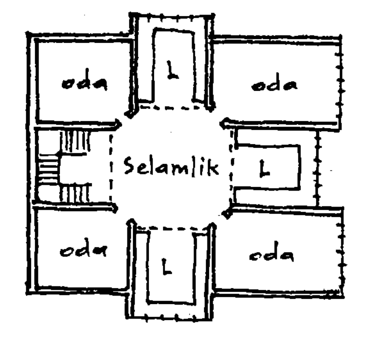
F174 Roman house at Baalbek, floor plan



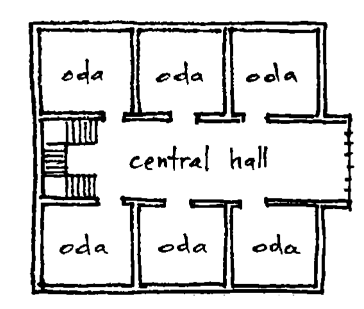
F175 Typical plan and section of atrium compluviatum



F176 Cinili Kiosk, Istanbul, floor plan



F177 Schematic floor plan of Turkish house



F178

the simple rectangular house nor the gallery house, which preceded this type, are organized along a central space or corridor.

Yet, if we compare the simplest examples of liwan houses with equivalent central hall houses (E34 with E48) we are struck by their extreme similarity: two closed side spaces are joined by an open central hall. They differ only in the number of floors and in the siting. While E34 is a single floor structure on the plain, E48 has two floors and is built on a slope. It may be that when the liwan house is built on a hillside and placed upon a substructure to provide for a flat base, builders found it more convenient to omit the courtyard in front of the liwan, and to turn the liwan toward the valley, making a door in the rear wall of the liwan. The liwan arch is then raised above the ground and protected without having a court. The substructure can be extended into the hillside to be used as a service floor. This introduces the vertical separation of living and working areas, which is an important step in the evolution of living habits.

The reversal of entry to the liwan markedly changes its spatial expression. Whereas previously it had been a covered part of the courtyard, we now have the impression of entering directly into an interior space, which will necessarily be railed off on its open side. The large liwan arch has the tendency to open the room up too much, and it is also redundant to build a large arch if it is not to be used as a passage. It becomes customary, therefore, to replace the liwan arch by an arcade of three or more arches, the triple arch design being preferred, because of formal aspects and the possibility of putting a door in the middle plus a balcony in front. Thus we can postulate that the central hall house developed from the liwan house under Lebanese siting conditions (F143).

The influence of environment can also be seen in the Ottoman house which underwent a similar transformation. G. Goodwin states that the plan of the Turkish residence (*konak*) may be derived from the Cinili Kiosk in Istanbul (built 1473).[44] This building was one of the living pavilions of the sultans in the Topkapiseray. Its plan is symmetrical and develops around a cross-shaped central space (F176). This space equals a square courtyard with liwans (L) on all four sides. Because of its special site (the garden of the sultan's palace), the building has many windows, a gallery, and on the sides, two external liwans (LA). Such openness to the outside is typical of the Turkish house in mountainous regions, and especially along the Bosphorus, where these houses are called *yali*.

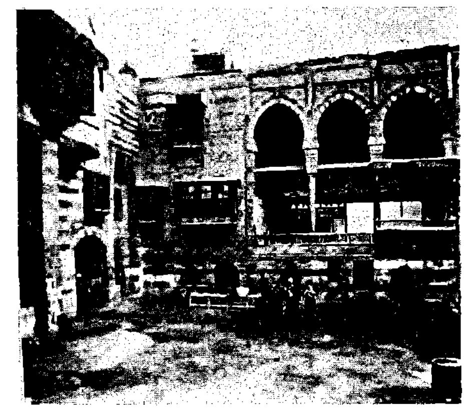
Goodwin writes about this change: "The concept of a central court suited sophisticated Ottoman life where each member of the family required his or her own room, the

corner rooms with projecting bays being reserved for the senior members; but the climate turned the concept outside in, so that the court became a hall and the rooms now looked outwards through ranks of windows. The yali of Sarfat Pasha at Kanlica is much closer to a Venetian palace in atmosphere than that of a sacred pavilion on which its plan is based, for it has a central hall with a grand staircase at the back and the water entrance at the front, and rooms down either flank" (F177).[45]

Another indication of the development is found in Goodwin's following statement: "The nineteenth century brought everywhere an increased interest in the definition of space and function in domestic architecture and a new regard for privacy even within age groups of a family. The result in Ottoman houses was for an extra room to encroach on the area of the open sofa."[46] In other words, the side liwans of the hall were walled off, and there remained a rectangular hall in the middle (F178). We may see from the Turkish example not only the importance of the influence of climate and location, but also the importance of the central hall in oriental houses.

Apart from what has been said above, the stress on a centrally positioned and open but covered space is evident both in the liwan house (F134) and the tarma house (F127). Reuther points out the arrangement of an open hall in the middle of one or more courtyard sides of the Iraqi house.[47] Franz Pascha recorded the courtyard elevation of a house in Cairo, dating from 1485,[48] which has a raised hall with three arches (F179). Similar halls are found in Persian garden pavilions[49] (F180), or in examples from Azerbeidjan.[50] In both cases climate and environment encourage the aperture of a sitting space in the middle of the house. The landscape and climate of Azerbeidjan are quite similar to those of Lebanon, and while F181 could be termed a gallery, F182 and F183 have facades very similar to those of Lebanese central hall houses.

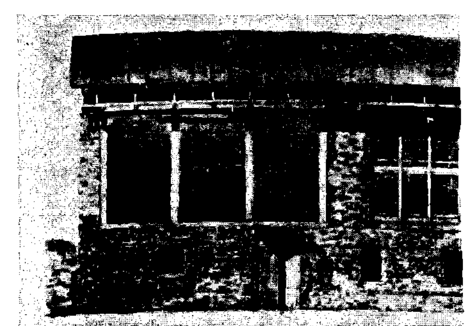
To sum up, we can say that the penchant for large halls, opening either to a courtyard or to the outside can be explained by oriental sociability, the prevailing warm climate, and the wish for openness without full exposure. We can assume, then, that the central hall design reflects an indigenous development. Also the triple-arch is not a foreign importation, but seems to have come as an inevitable solution.



F179



F180 Hasht Bihesht built in 1610



F181 House Fatulajew, Shusha

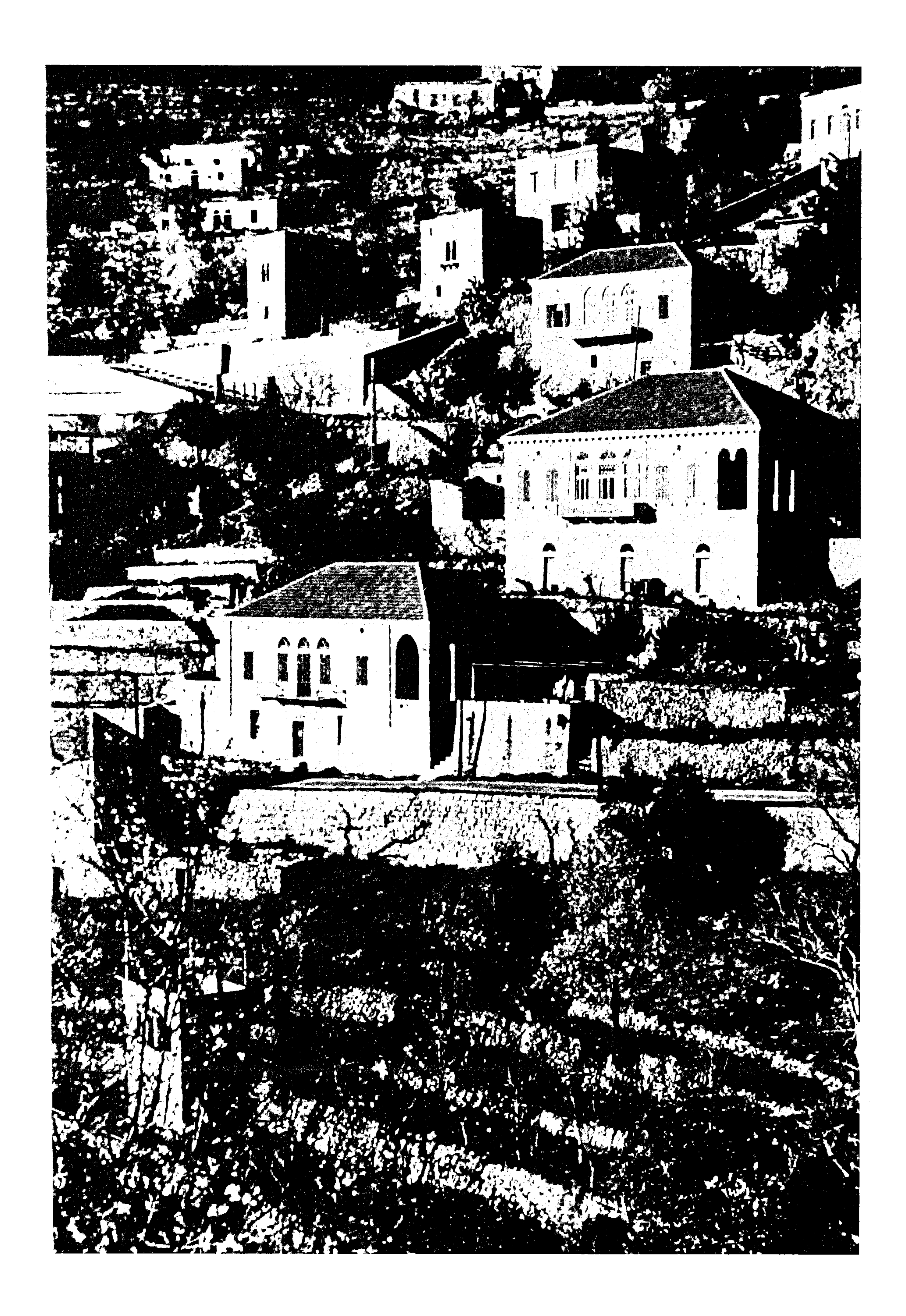


F183 House on Chatshamaskij street, Kuba





F182 House Natawan, Nucha



5. Combination Types



F186 Hall with entrance liwan (E41)

IN DISCUSSING the various kinds of houses we came across several combination types. Although it can be assumed that the general development started with the simple rectangular house and gallery, liwan and central hall being added later, all types of houses remained in use simultaneously. The choice was dictated by economic considerations, by local conditions or practices and personal preferences. Clients agreed with the builder (*mu'allim*) on one of the common house types; no plans were ever prepared. This procedure encouraged the repetition of similar houses, but it is understandable that modifications and combinations were sometimes made.

If we review the examples presented we recognize the first combination type in E25. The plan indicates that a central hall house received a gallery in front. This combination offered three advantages: the addition of a sitting porch accessible from the hall and the two front rooms, protection from the sun for the rooms exposed to the southwest and

the possibility of access from the valley side of the house. The owners of this house seem to have liked direct connections to the outside, since the rooms to the north also have individual terrace doors.

E27 consists of the asymmetrical combination of central hall and gallery. The entrance is awkwardly placed in the corner of the hall, the gallery overlaps the hall by one arch, and the house is also weak in its formal details (F118).

The plan of E31 exhibits remarkable similarities to a house with three liwans (F184). The red tile roof is most likely a later addition and so is the court arcade. It was probably at the same time that the liwans were walled off and the side entrance was introduced.

Examples E32 and E33 are special combination types of central halls and exterior galleries. The living wings are designed around the central hall scheme, in E32 with the stairway included on the side, in E33 with the stairway being a part of the service wing. The dominating external features of these two houses are the galleries surrounding each floor, in all probability inspired by Venetian examples (F185). The clerestory in E32 which supplies air and light to the central hall is also of interest.

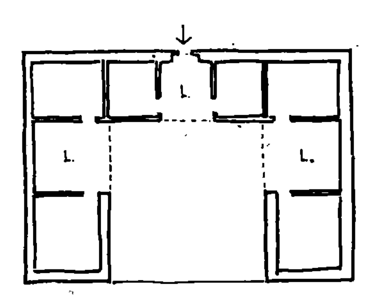
Example 36 is the result of successive addition of elements, such as closed rectangles, gallery and liwan on an irregular site.

Very accomplished combination types are produced in E40 and E41. While E40 retains much of the liwan and courtyard character, only with added corner arcades, the west side of E41 is a complete gallery. In this house the liwans have become passages located in the corners of the courtyard. On the west side of the court two of them define a prominent single room, the salon. On the whole E41 is a very attractive and imaginative design (F186-189).

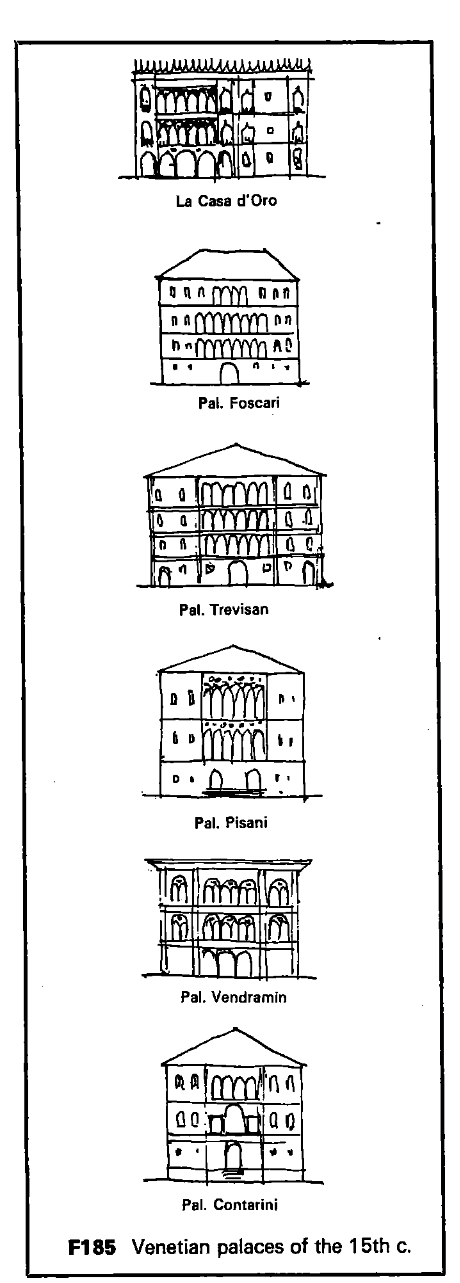
It is worth noting that the houses E38 to E41, which form a distinct group, are all located in Amshit. They are a mixture of normal family residence (gallery or central hall type) and the courtyard and liwan type of the upper class. The local history of Amshit may furnish an explanation. In 1810 the Toubia family (E40) was in control of all coastal trade from Maameltein to Batroun, and Emir Beshir II entrusted Michael Toubia with the collection of taxes in this area.[51] Although not raised to feudal eminence the Toubia family obtained a special position which subsequently influenced the design of neighbouring buildings.

Examples 45 and 47 are combination types in as much as they combine liwans and galleries. However, since they are closely related to courtyard houses, they were dealt with in the relevant chapter.

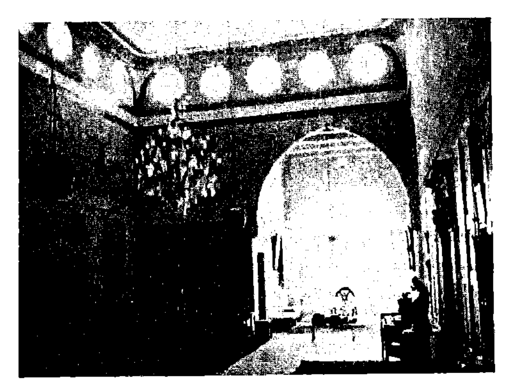
Many houses do not fit any of the recognized types. They are designed simply to suit the conditions of the site and the needs of the builder. Other houses are the result of successive



F184 Original floor plan of E31



F185 Venetian palaces of the 15th c.


F187 From E41

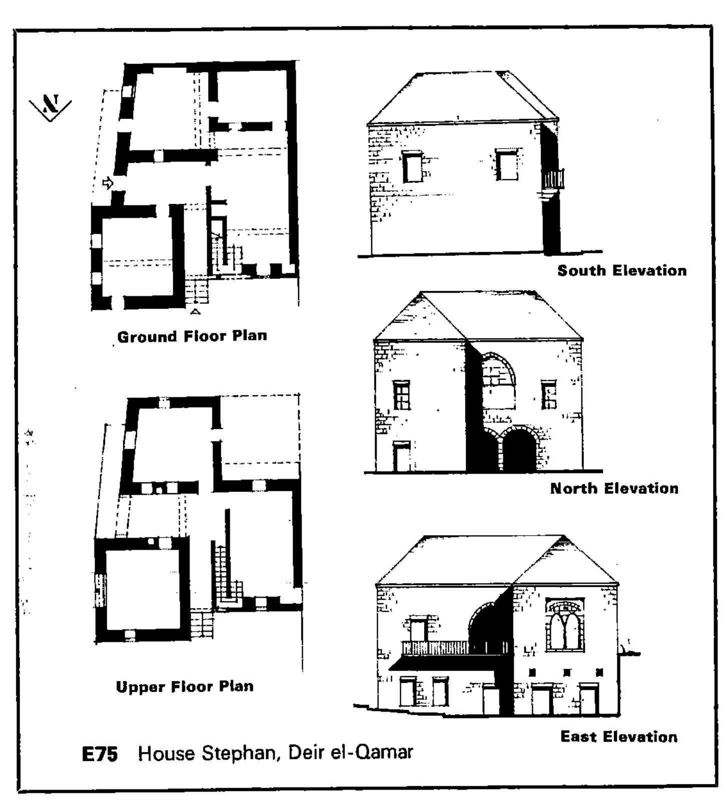

F189 From E41


F188 From E41

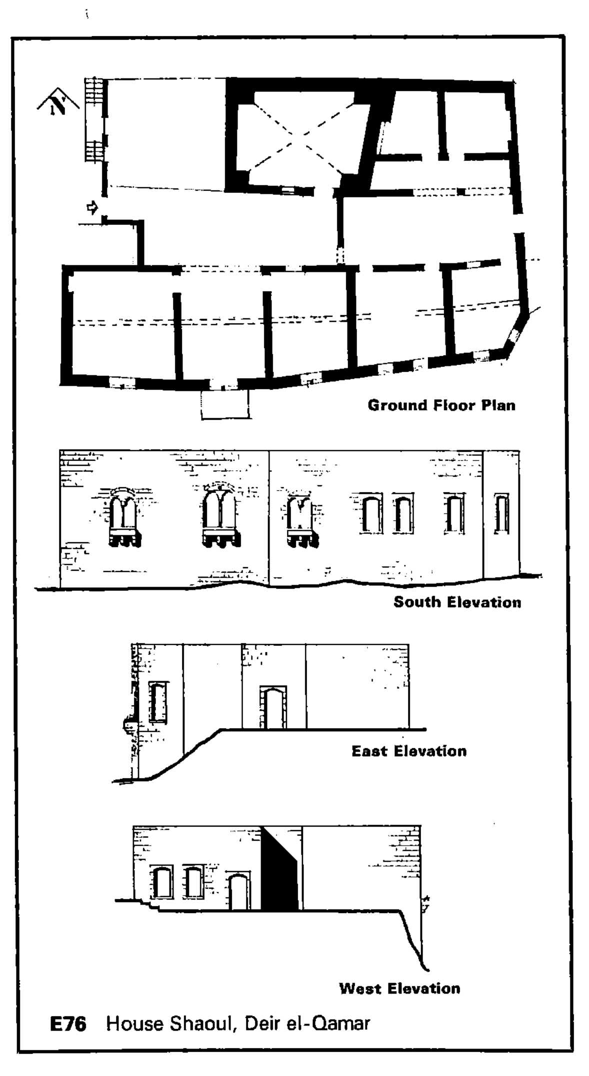
addition of elements such as closed rectangles, galleries and liwans on small, irregular sites. These are usually modest houses, yet it is often remarkable what quality is achieved in spite of the limitations imposed. As examples may serve E75, E76 and E77.

The most popular combination type, which was widely built at the end of the 19th century, consists of a central hall with a gallery in front or at the side. E78, E79 and E80 are all central hall houses. E78 has a gallery on the entrance side and serves as a porch. E79 has a gallery on the valley side, but also the triple arch is turned towards a fine view. E80 finally brings the direct superposition of gallery and central hall. The last house is a good example of late 19th century influences: classicist window or door decoration and medieval arches over pseudo-ionic columns.

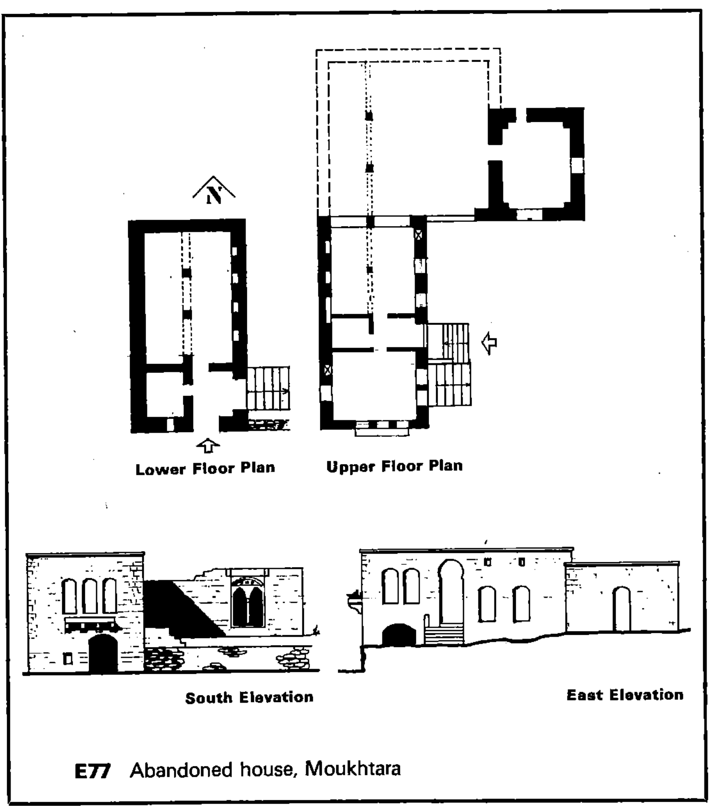
In this chapter we should mention also the famous Palace of Beit Eddine which dates from the beginning of the nineteenth century. It is an extensive complex of buildings, combining all the various types of designs, with particular emphasis on Syrian palace architecture. This building exceeds the limits of this study, as the various palaces of Lebanon merit a treatise in themselves.



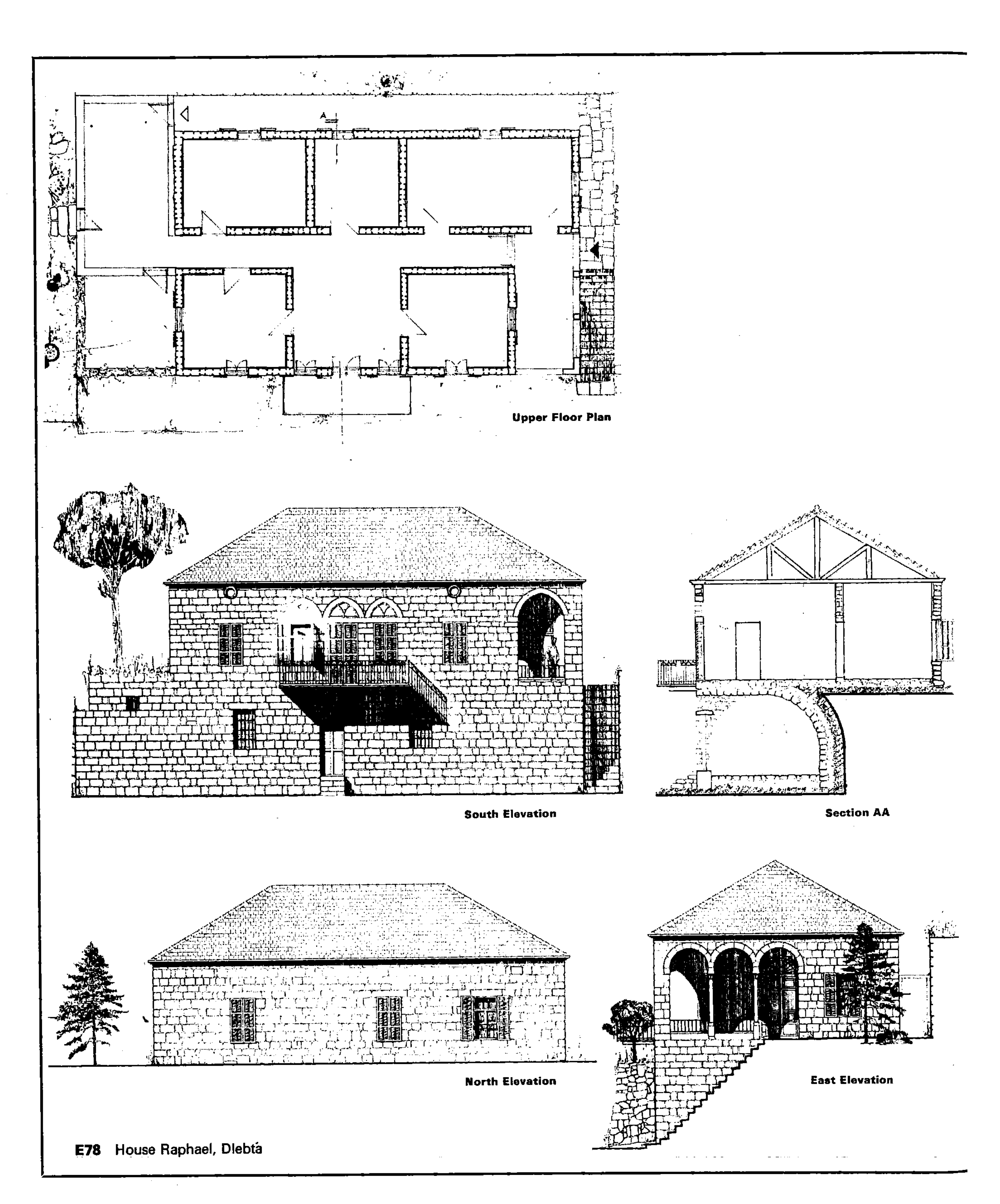
E75 House Stephan, Deir el-Qamar



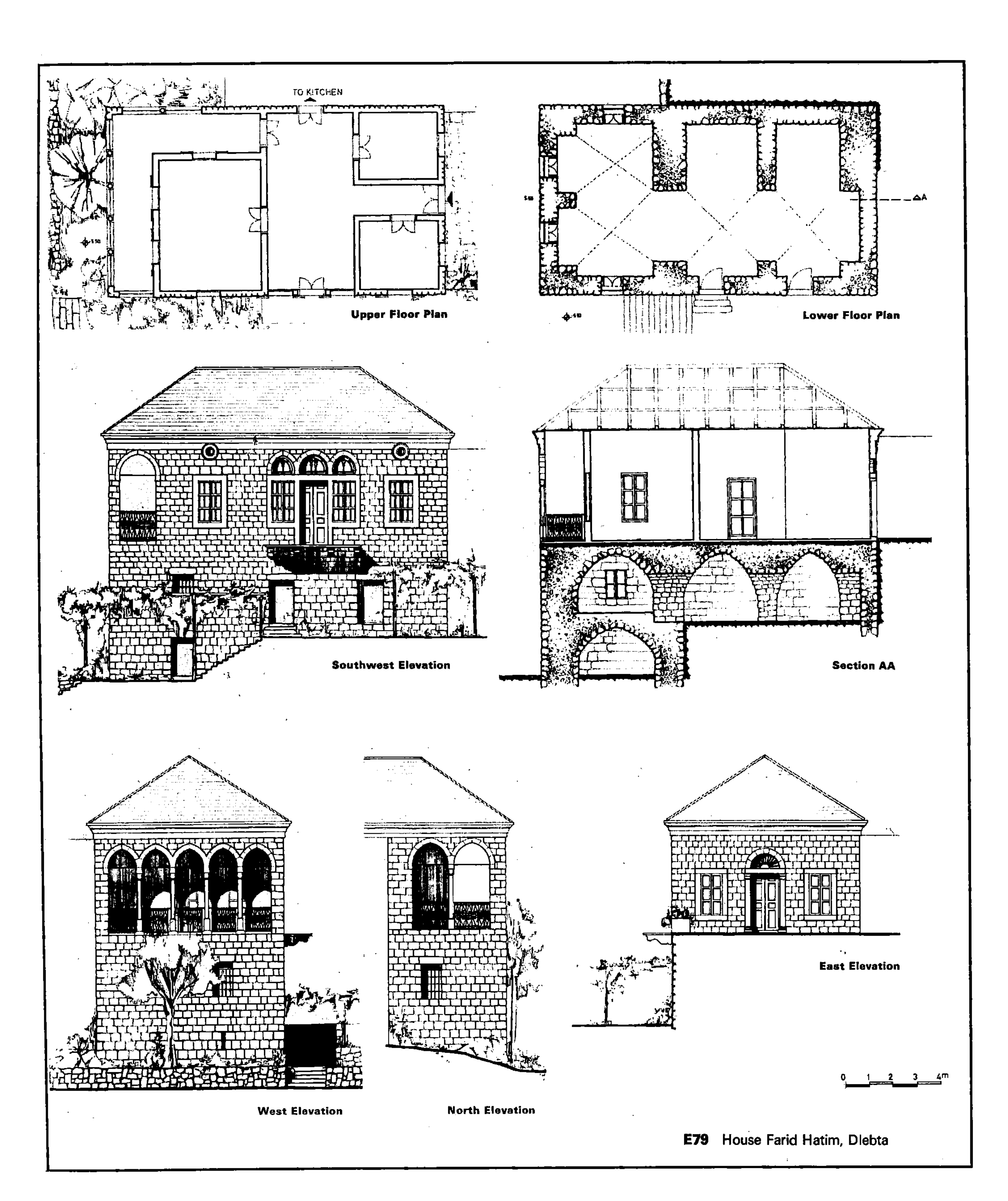
E76 House Shaoul, Deir el-Qamar



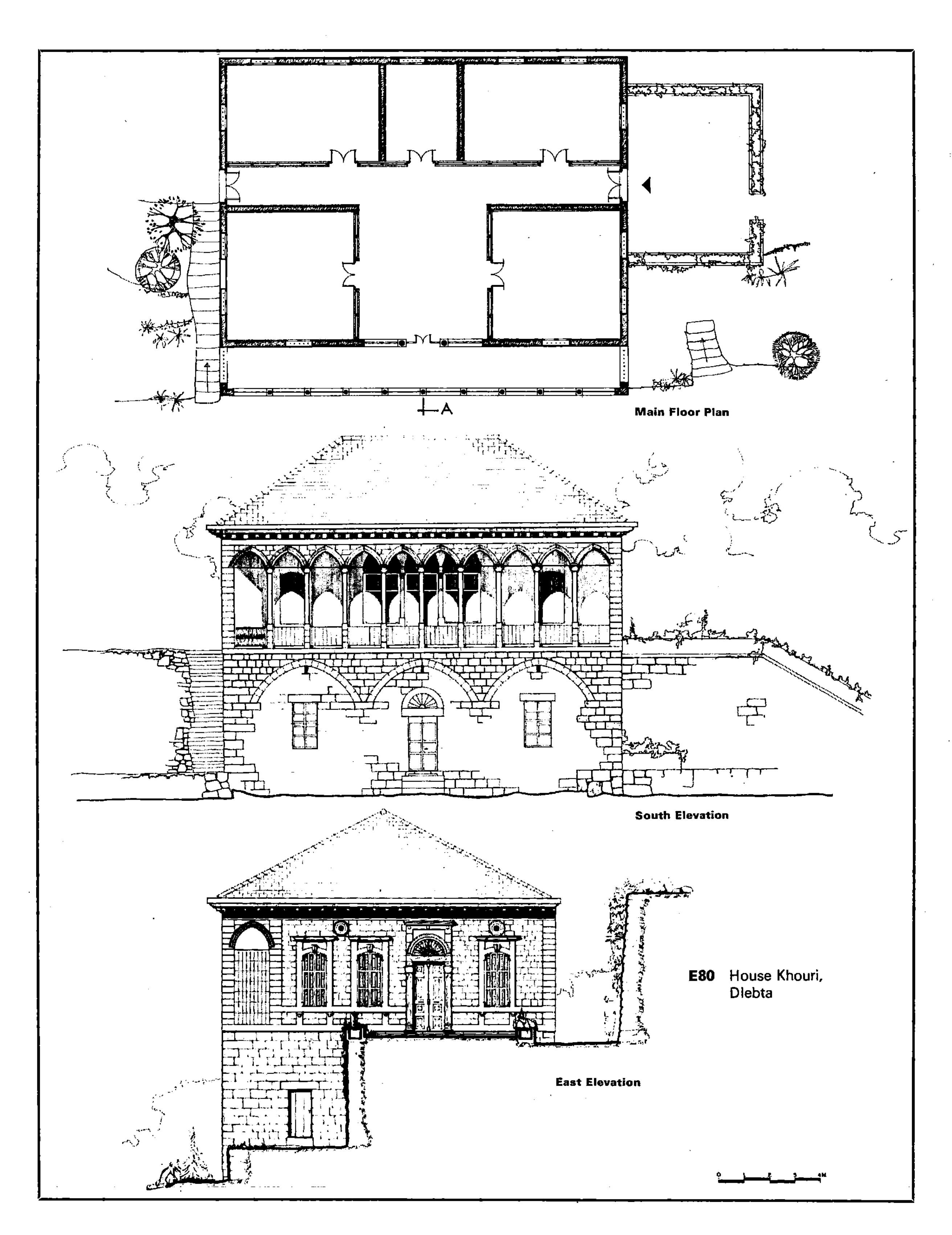
E77 Abandoned house, Moukhtara



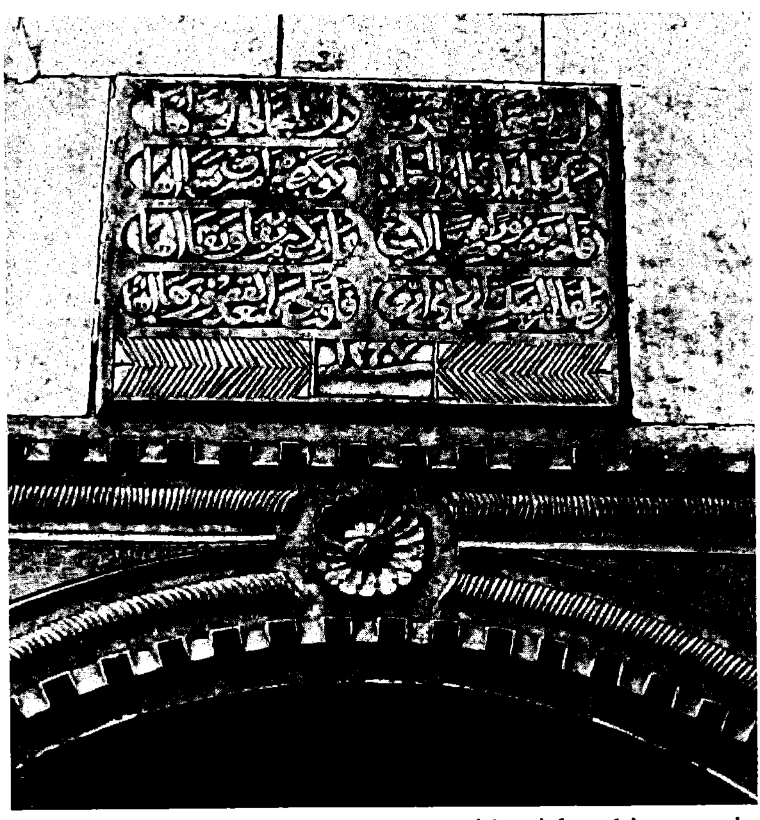
E78 House Raphael, Dlebta



E79 House Farid Hatim, Dlebta



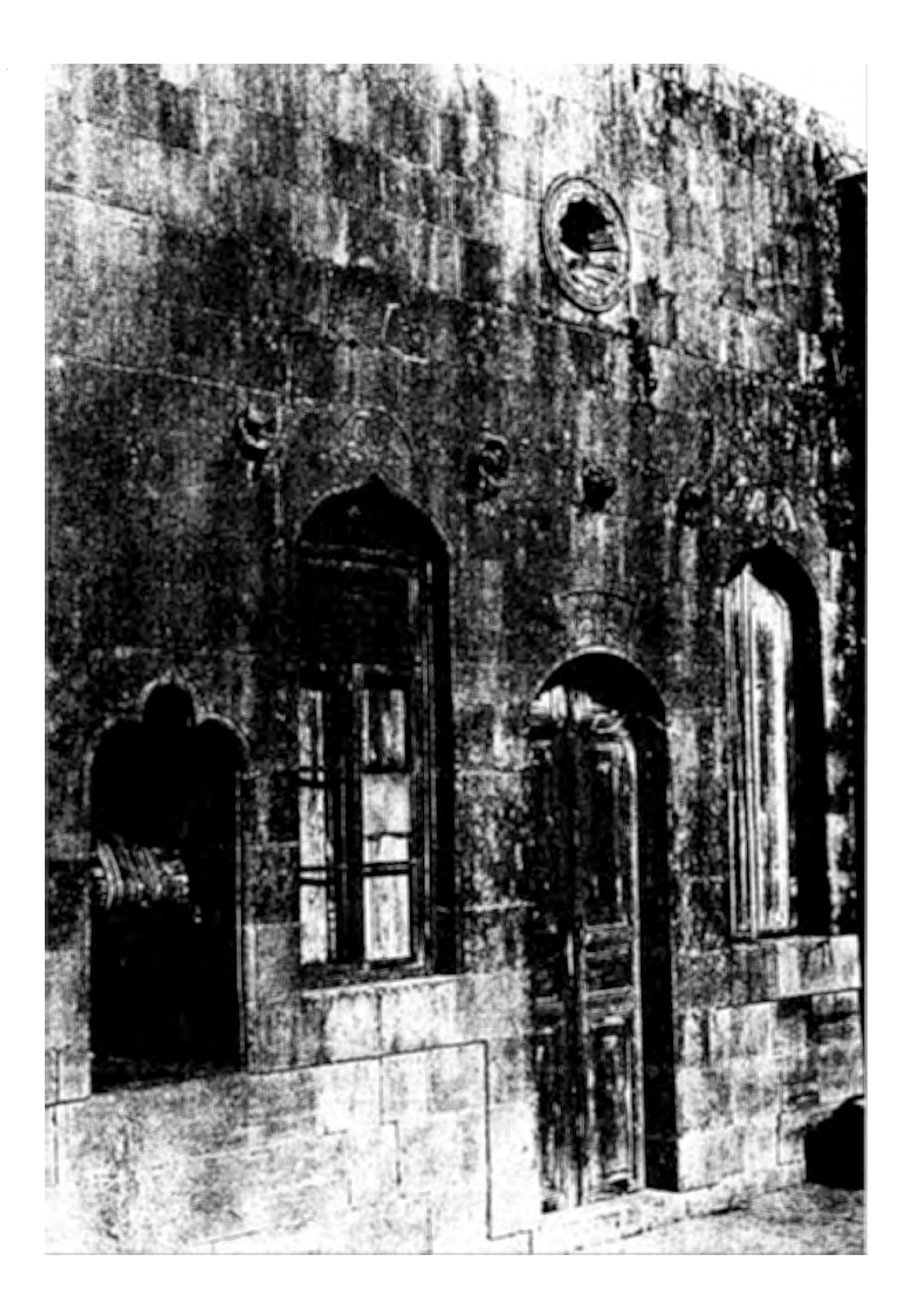
E80 House Khouri, Dlebta



6. Dating and Chronological Sequence of Buildings

THE EXACT DATING of anonymous residential architecture in general is difficult, in a country like Lebanon it is practically impossible. Communal chronicles do not exist, there are only chronicles of a few ruling families or of religious institutions. This is why exact dates can be given only for the residences of important families (E43 to E47). Even today no exact cadastral plans exist for the whole territory of Lebanon. Building permits were not required before 1950 outside the main cities. Also, the buildings rarely carry inscriptions.

The only possible way to determine the date of construction of a house is by questioning the inhabitants, who usually figure out the generation to whom the house may be attributed. Once a house has changed ownership it is quite impossible to obtain a useful answer. We have to rely then upon comparison with similar dated buildings. In the case of the most simple houses which exist in a regenerative fashion, this is not possible either. Some established dates of houses are given, however, in connection with the list of examples (appendix). We may assume that the houses for which no dates can be determined are generally older than those whose date of construction is remembered. On the whole we can say that the chronological succession of examples corresponds well to the morphological evolution of the houses, and does not present any contradictions.



III

THE ELEMENTS OF DOMESTIC ARCHITECTURE

1. WALLS

The exterior walls of houses generally act as bearing walls. Internal vaults either pierce the walls and remain open, or they are closed by a wall panel (F155). In this case, the vault section may appear as an arch (F56), or be hidden behind the outer face of the wall. The walls are not organized into a system of piers and panels, according to the inner structural order of the building, but are treated as independent planes. The classical division of a facade by means of cornices, string courses, friezes and pilasters is alien to Arab architecture. The Arabs, having adopted the structural solutions already in use in conquered areas, did not endeavour to express the tectonic contents of a building. They were, however, masters in the ornamental treatment of surfaces, since their nomadic origin had limited their artistic efforts to the decoration of every-day utensils such as textiles and wooden or metallic implements.

In Lebanon we find a high quality of workmanship in stone, expressing an intimate knowledge of the material, its texture and color. Strong effects are achieved by slight variations in the surface finish (E68, F138, F232). Cornices are either nonexistent or applied with restraint in order not to diminish the importance of the wall surface. They consist of slightly projecting string courses, flat ovolo — or cyma moldings, zig-zag ribbons or dentils over edge (F107, F110, F118, F153, F156, F157). Even cornices with modillions are very modest in their application (F154, F159). Simple houses with hip roofs often have decoratively cut wood friezes carried around the eaves (F119, F121, F151).

Openings in the wall such as windows, doors and galleries, are treated as individual elements, but are combined into groups when too close together. This practice counteracts tendencies of movement within a facade, and preserves the static harmony of the design.

Towards the end of the nineteenth century, Western influence introduced the dividing of walls by means of horizontal and vertical projecting bands. A comparison of E32 with E33 shows the change clearly. Often these applications look very artificial and are rather disturbing (E63, E67).

An interesting detail are the cut-off corners in the ground floors of buildings, usually made to facilitate traffic or to arrive at a regular plan in the upper floor (E31 southwest corner, E44 southeast corner).

2. ARCHES

Because of climatic and material circumstances, the use of arches is very widespread. By means of the arch the house connects to the courtyard (liwan) or opens to the view (gallery and central-hall). Arches therefore strongly determine the appearance of Lebanese architecture. The arch forms can be divided into three groups: Genuine, adverse and decorative arches.

Genuine arches, i.e. arches following the natural line of vaulting, exist as four types:

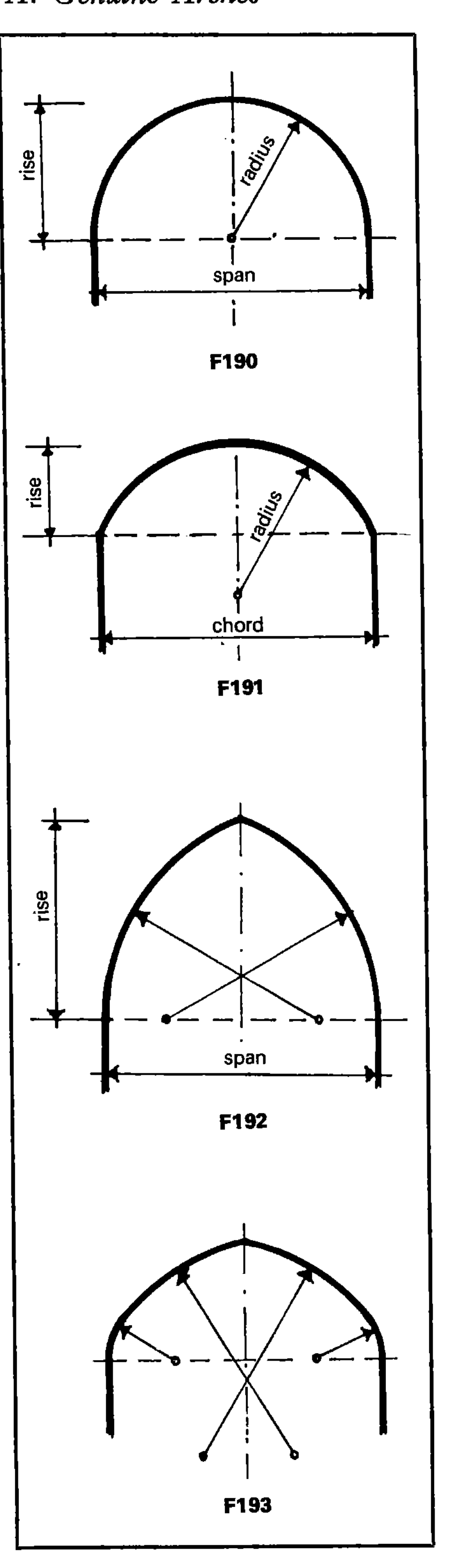
A. Genuine Arches

i. THE SEMI-CIRCULAR ARCH (*nusf rūmiyyeh*—Roman arch). It appears mainly as relieving arch above lintels (F15, F190).

ii. THE SEGMENTAL ARCH (*hilāliyyeh* — crescent of the moon) (F191). It consists of an arc, the chord and rise of which follow a certain proportion. We distinguish arches called *tultiyyeh* (a third), *rub'* (a quarter) and *khamsiyyeh* (a fifth), indicating relations of rise to chord of 1:3, 1:4 and 1:5. The segmental arch in F207 is a khamsiyyeh. Segmental arches are mainly used as relieving arches and over windows and doors.

iii. THE POINTED ARCH (*ra'siyyeh* — pointed) (F192). It dominates eastern Arab architecture and has become its trademark. Its origins go back to ancient Mesopotamia, and it was still used locally when the Arabs conquered the Middle East. There is a pointed arch at Qasr Ibn Wardan, built between 561 and 564.[52] The Arabs were responsible for the pointed arch spreading westward, and the Normans picked it up in Sicily and introduced it in northwestern Europe where it helped spark the Gothic style. The plain, pointed arch is mainly used in vaults. It consists of two circle-arcs, the centers of which are on the same level. The proportion of rise to span varies between 1:1,3 and 1:1,6; usually it is close to 1:1,4 (55:7). Other than in vaulting we find the pointed arch mainly above door recesses (F212).

iv. THE TUDOR ARCH (*'ajamī* = Persian), also called four-centered or depressed arch (F193). It consists of four arcs, the two outer ones springing from centers on the springing line, the two inner ones from centers below the springing line. It is a typical eastern arch form but, surprisingly, occurs very rarely in Lebanon (E45, south elevation).

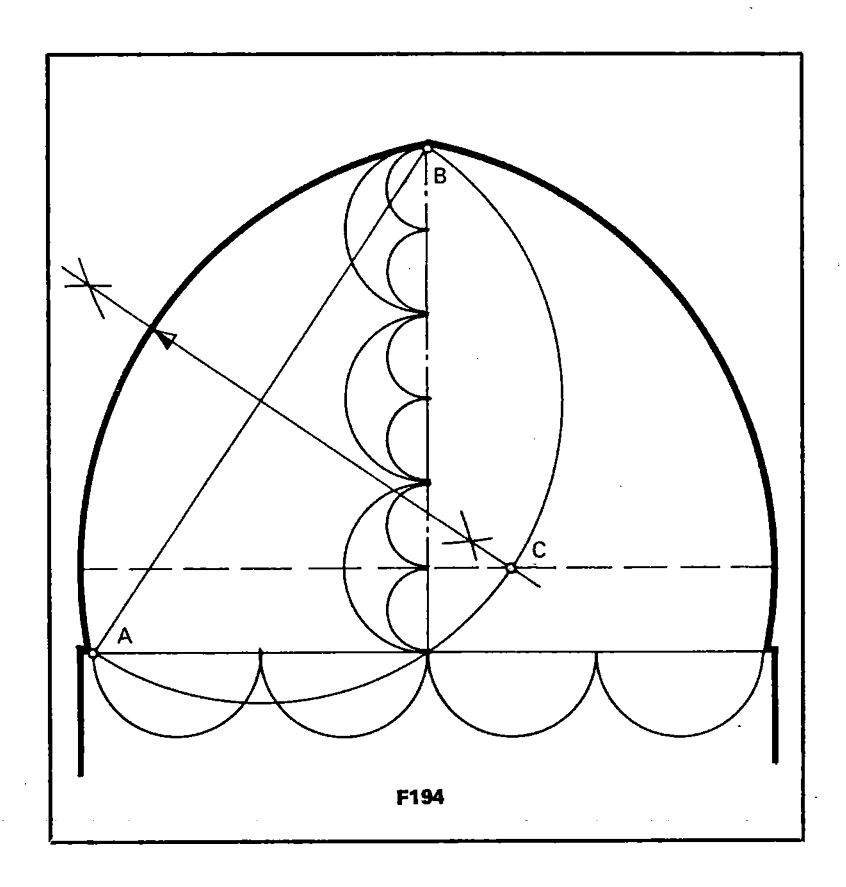


B. Adverse Arches

Adverse arches do not fully correspond to the natural line of vaulting.

i. THE HORSESHOE ARCH (*mughrabi* = from the Maghreb — North Africa and Spain). It occurs in Lebanon mostly in its pointed form, as a pointed arch which is extended below the springing line by about one fifth of its rise. The most common and, if we may call it so, the "ideal" ratio of rise to span is 3:4. The construction of the centers of the arcs for such an arch is indicated in F194: We draw a semicircle over AB and its intersection with the bisector of AB will produce the center C, which in turn defines the level of the springing of the pointed arch and the top of the horseshoe extension, subdividing the rise of the whole arch 1:5. The horseshoe extension is much less pronounced than is usual in western Islamic architecture, yet it is instrumental in giving the arch its oriental touch. The face of the supporting elements below the arch (wall, capital, console) is usually flush with the maximum width of the arch, producing the characteristic nose below the horseshoe (F195, F196).

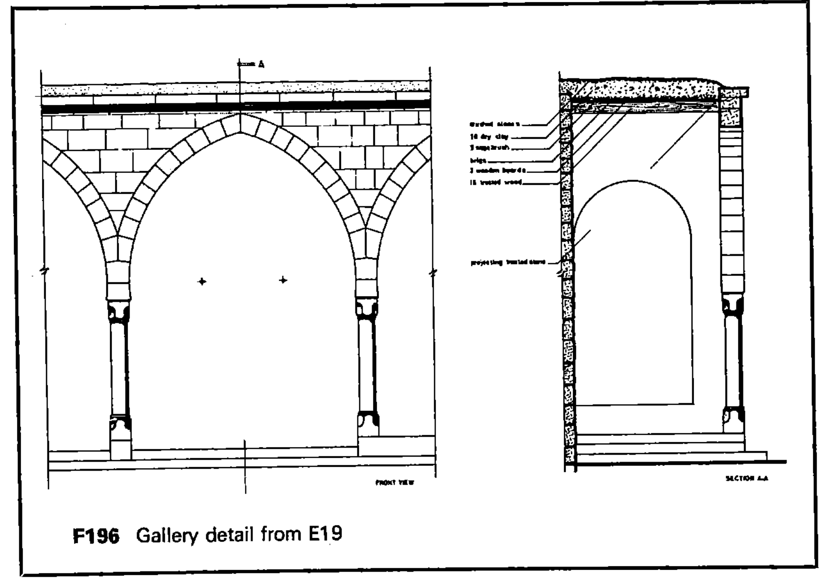
ii. THE SHOULDERED SEGMENTAL ARCH (*madaniyyeh* = from Medina, the city) (F197). This arch, though very frequent in Iraq[53] does not appear at all in Lebanon.



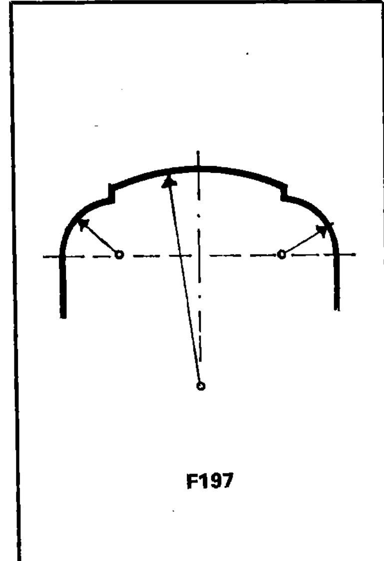
F194

1 meter

F195 Gallery detail from E30



F196 Gallery detail from E19



F197

C. Decorative Arches

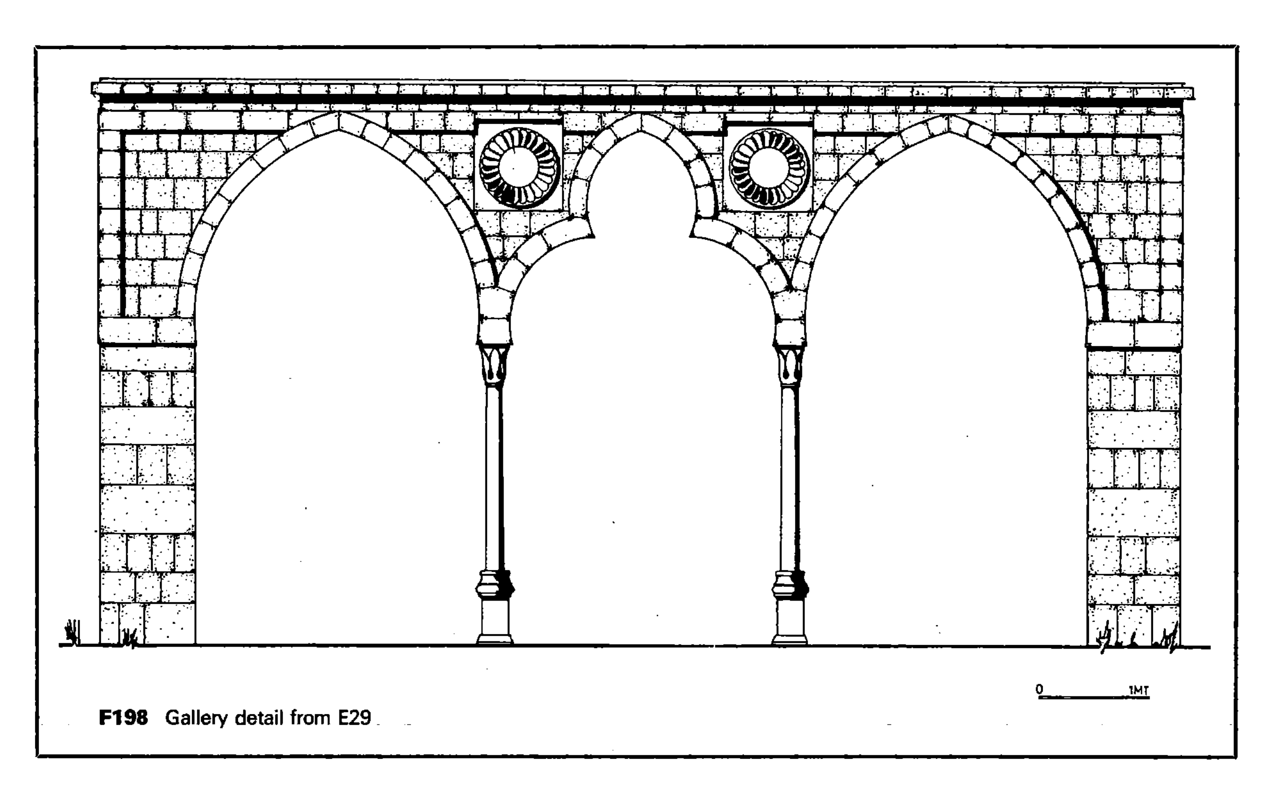
Decorative arches deviate totally from the natural vaulting line. There is, above all, the pointed trefoil arch, consisting of specially cut stones which are often assembled like corbels rather than in the form of an arch. Trefoil arches are found above windows, sometimes in arcades (F112, F198, E29). Sometimes there are also arches with undulating intrados (F115) or false arch shapes, actually built of projecting blocks of stone (F233).

D. Construction of Arches

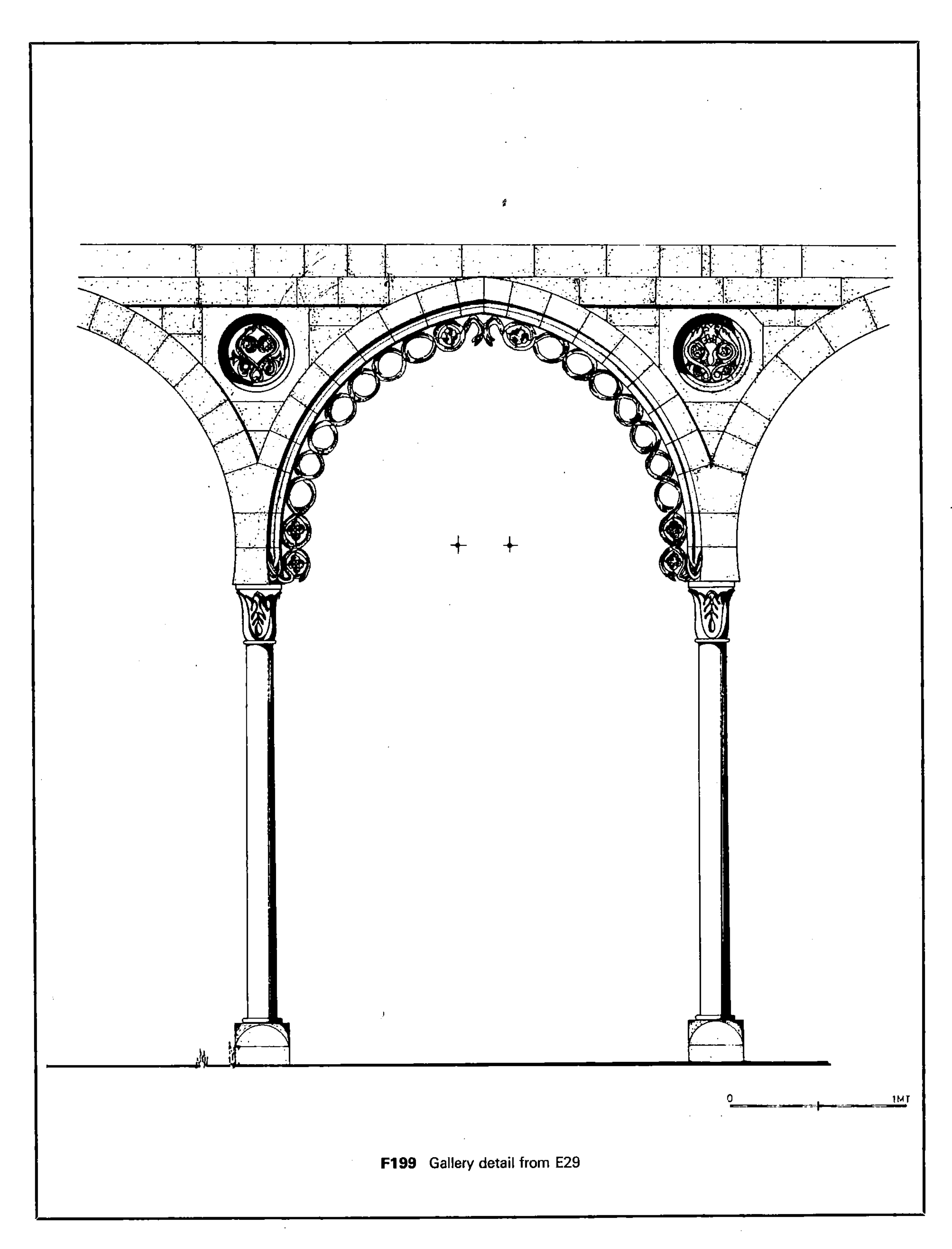
The arches are always made of cut stone. With the exception of decorative arches the voussoirs are cut radially. It is typical of the Arab concept of design that the imaginary flow of force in the arch is not expressed by a suitable molding running parallel to the extrados, but that it is either left plain and undistinguished from the surrounding wall area, or the voussoirs of the arch are emphasized as individual units, each with its own decoration, or each in a different color. Arches are either simply cut out of the wall surface or set off from it by framing panels or bands.

The complicated patterns of interlocking voussoirs are seldom cut through the whole depth of the arch. Sometimes these patterns are only a facing applied to a normal arch. In special cases the intrados of the arch receives decoration (F199).

Lebanese builders always provide the necessary abutment for the stability of the arches; tie rods are not employed.



F198 Gallery detail from E29

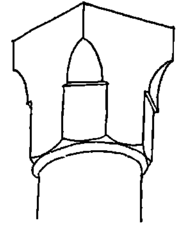


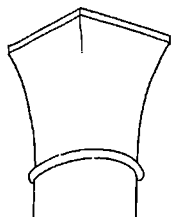
F199 Gallery detail from E29

3. SUPPORTS

A. Pillars

The use of timber or stone pillars as supports of timber roofs was described in chapter II 1 B. Plain stone piers (*'āmūd*) are used to support groin vaults. The transition from pier to column begins with chamfers on each edge (F35), giving the pillar an octogonal cross section.



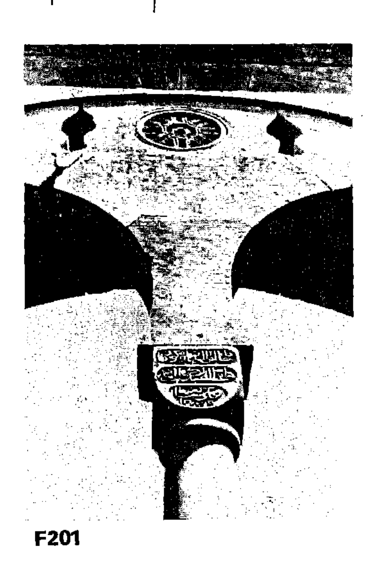


F200

B. Columns

Pillars with circular cross section are called columns (*sham'āt*). Their division into base, shaft and capital is not strictly adhered to. The shaft is always very slender (1:10 to 1:14) and without entasis. It is usually monolithic, measuring 15-20 cm. in diameter and having a torus at each end. Capital and base are frequently identical, but in a mirroring position (F46). The column shown in F46 deviates from the norm since it is the support of four meeting crossvaults. Normally columns are only used to support arches.

The purpose of the capital is to provide a satisfactory transition from the circular cross section of the column shaft to the square base of the arch. Basically we can distinguish two capital designs, one of prismatic character, changing from a square top to an octogonal lower part by chamfers, which is then rounded off to a circular bottom; the other of rotational character, similar to inverted bell capitals. However, since there is never a distinct abacus, the bellshape changes itself from circular bottom to square top, producing in essence something like four conoid surfaces (F200). Less frequently we find the cushion capital which uses the pendentive principle to produce an exact spherical transition from the square to the circle. If we cut a hemisphere on five sides we get the capitals shown in F46 and F201. F201 is an example from Moukhtara with the inscription of a Druze saying.[53 a]



F201

Appropriately, the prismatic capitals are decorated in abstract, geometric patterns (F202) while the bell capitals receive leafage design (F199). It would seem that geometric designs are more prevalent on small columns like window colonettes, while leafage designs are applied to gallery or triple arch constructions. Antique spoils, though fairly plentiful in some areas, are rarely used in residential construction because their dimensions are too large.

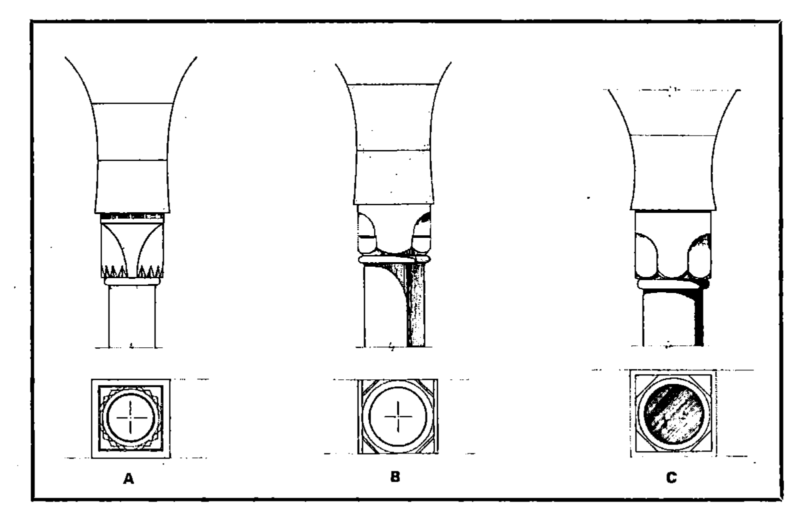
Capitals carrying timber beams generally have an additional stilt block added on top in order to enlarge the bearing surface (F203).

4. APERTURES

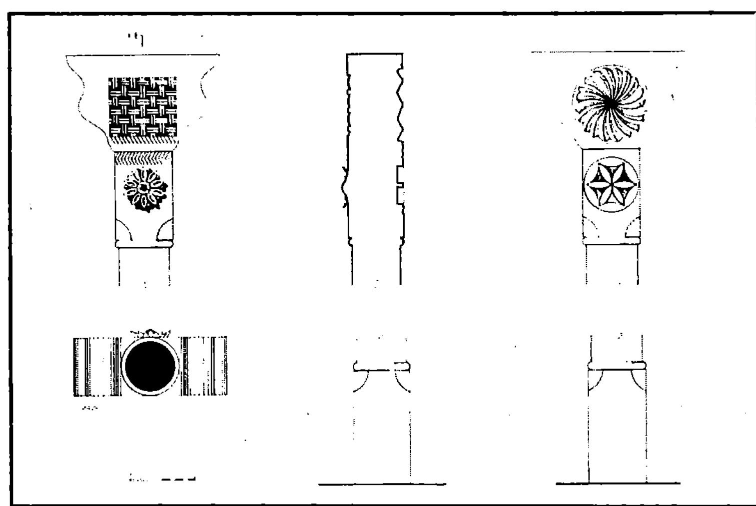
IN DESIGNING the openings in a wall the decision has to be made whether to keep the wall predominant in the facade, or to treat openings as important elements in their own right. A guiding factor in this decision will be the relative importance of the aperture. In general the continuity of wall surface is emphasized in Lebanese architecture, as in Arab architecture as a whole. Openings are treated as secondary while

frequently having highly decorative features. They are not applied from the outside, but are cut-outs which are punched through the wall. The stone casings are not differentiated much from the wall; nor is the immediate frame around the opening stressed; instead, smooth rectangular panels surrounding individual or grouped openings are introduced, which read as surfaces within a surface. As a result, the composition of the facade deals largely with pattern relationships and a great variety of individual openings can be accommodated without disturbance.

Arcades, gates, doors, windows, ventilation holes and niches comprise the various apertures in walls. They are placed according to internal needs and functional requirements, not to follow a preconceived design of the elevation. This may result in a more or less irregular distribution, but since the plans themselves are often symmetrical, the elevations also display in many cases a regular form of arrangement.



F202 Examples of capitals 1:25
a. House Abou Hatoum, Baaqline
b. House Saleh Eddine, Baaqline
c. From E19



F203 From E21

A. Doors



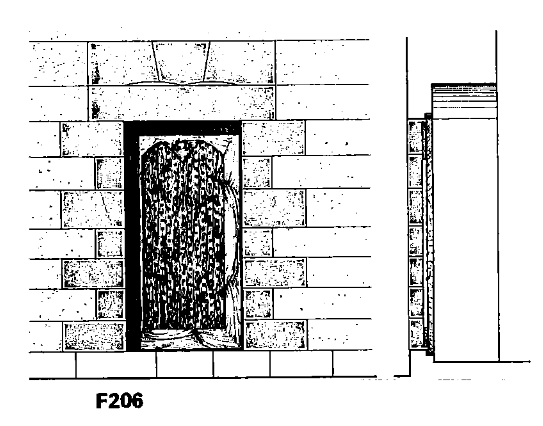
F204

F205

In rough random masonry the house entrances are often framed by whitewashed plaster (F51). Lintels (*'tāb,* pl. of *'atbeh*) are made of wood or stone (F204, F205). As soon as ashlar cut masonry is used, the flat stone lintel is protected by a relieving construction. This could be a slightly undercut false arch, as in F206, or a semicircular or pointed arch forming a lunette over the door (F15). Segmental arches over doors are very frequent (F207, F208), and are generally stepped to ensure, together with the projecting jambs, that the door closes effectively. The lower outer portion of the arch is not more than 20 cm. thick and is often composed of decoratively cut interlocking voussoirs (F207, F208). Door jambs (*ḥdūd,* pl. of *ḥadd*) and arch are usually integrated into a rectangular panel containing additional decoration or even additional openings. The doors are made of single or double leaves, and large door leaves contain small auxiliary doors for safety (F209). The woodwork is sometimes beautifully carved (F210).

We can see the western influence on door design in examples E67 and E73. In E67 the door jambs are continued up beyond the relieving arch and even cause small projections in the cornice. In the entrance to E73 the lintel has received its own little cornice, and the jambs are turned into pilasters.

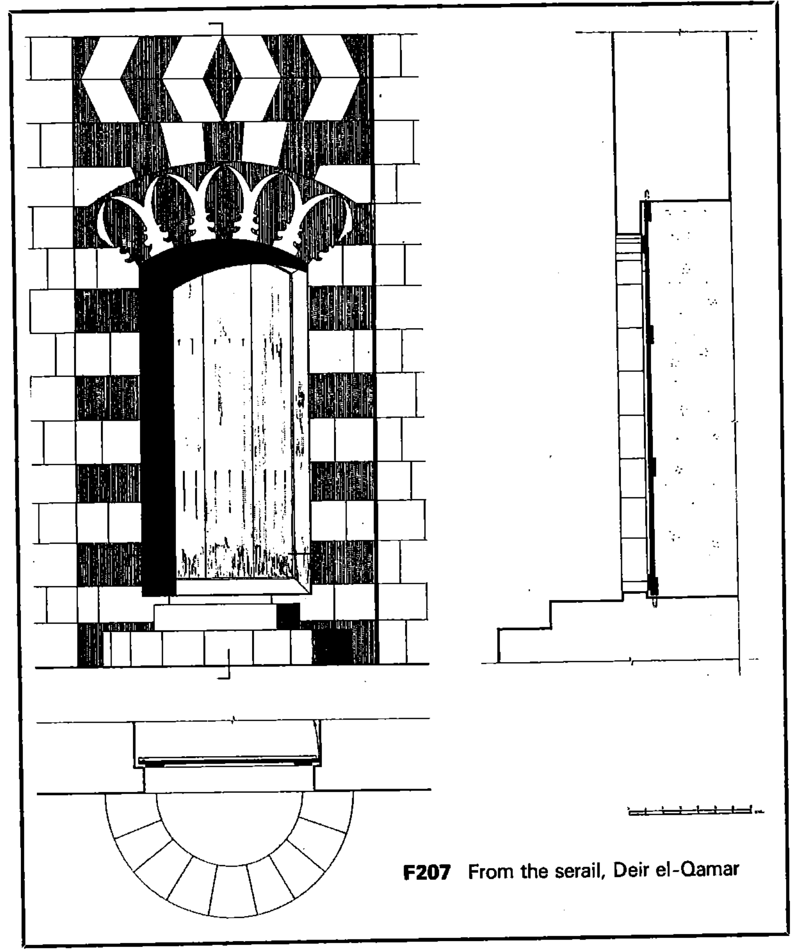
B. Gates



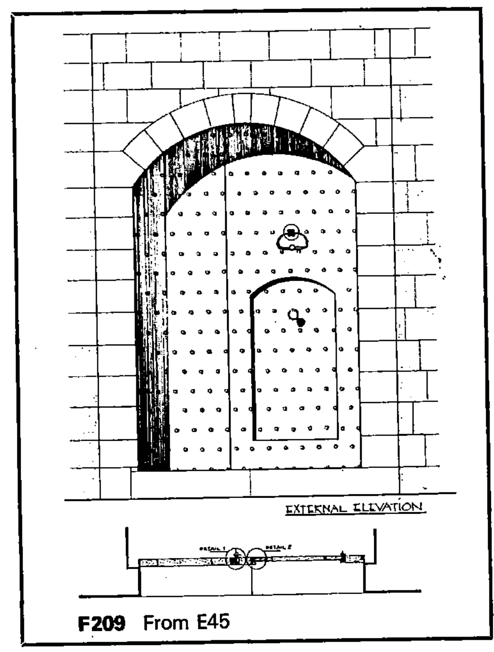
F206

In Lebanon gates are designed like monumentalized doors, since for security reasons the door leaves themselves are small. Again, a low and narrow postern with high threshold is included, this feature also being of social significance, for only important guests were received through the fully opened gate while all other visitors had to bend head and knees when entering. In order to magnify the appearance of the doors they are set into richly ornamented niches. This design probably originated from vaults that were closed up (F211), or from the walling up of a liwan as seen in example 30, ground floor south side.

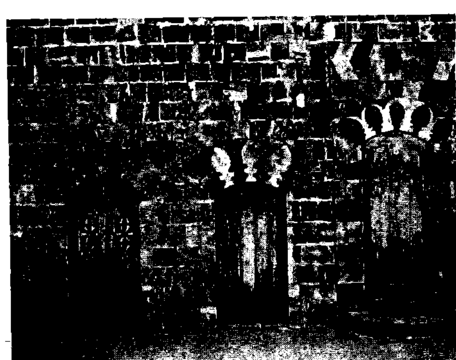
While the actual door still receives a segmental arch, the niche is covered by pointed, horseshoe or trefoil arches, and surrounded by framing motifs. Elaborate designs such as those shown in F212 to 216 are only found in exceptionally important houses (E46), in palaces or public buildings. In most houses presented here the entrances are handled with remarkable restraint (E43, E45, E47).



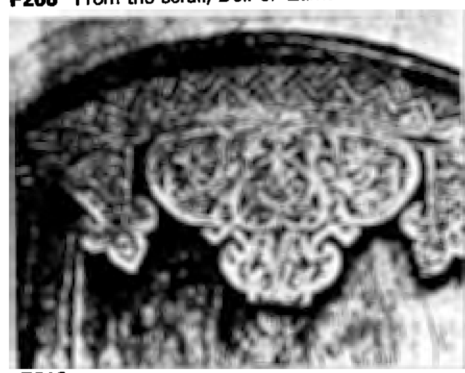
F207 From the serail, Deir el-Qamar



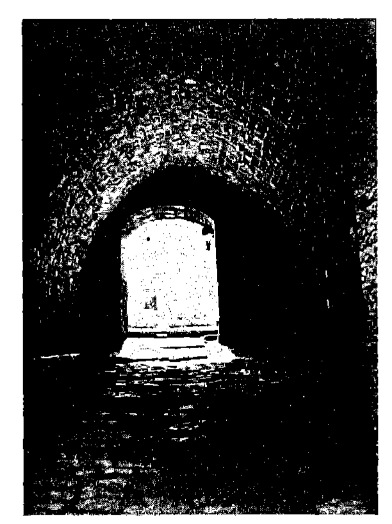
F209 From E45



F208 From the serail, Deir el-Qamar



F210



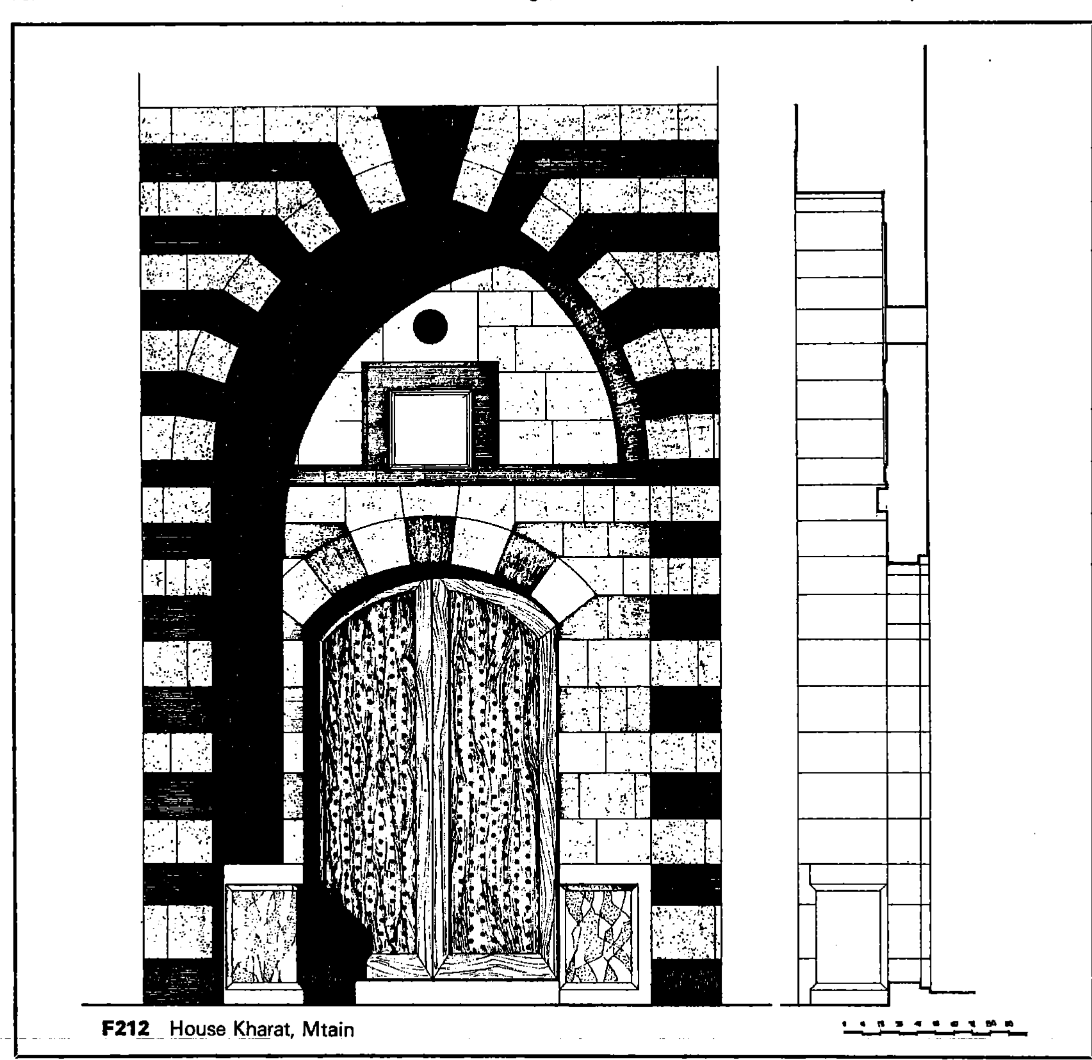
F211 Deir el-Qamar



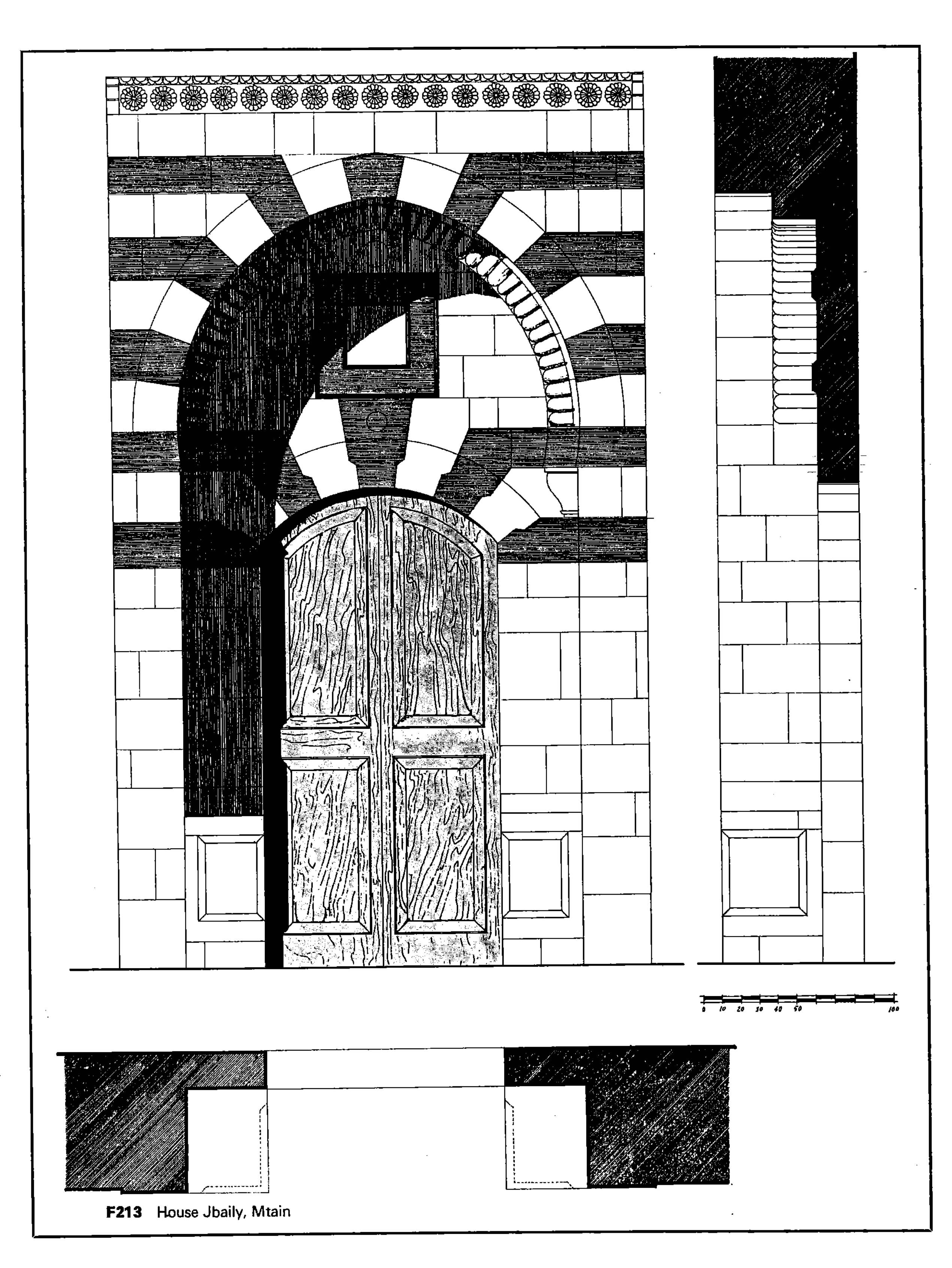
F214 St. George, Ehden



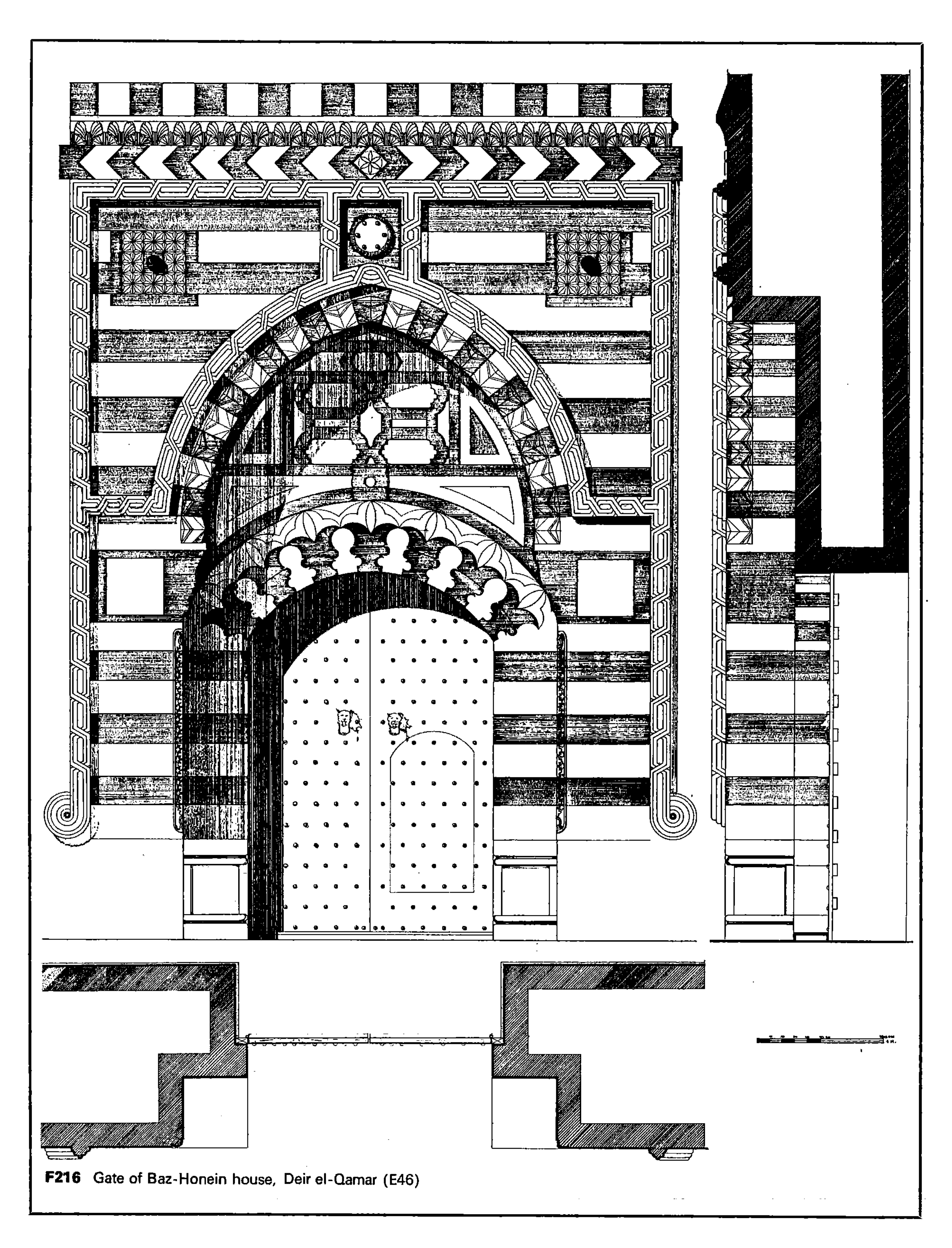
F215 Emir Amin palace, Beit ed-Dine



F212 House Kharat, Mtain



F213 House Jbaily, Mtain



F216 Gate of Baz-Honein house, Deir el-Qamar (E46)

C. Windows

Simple rectangular windows may have a lower outer and a slightly raised inner lintel to allow for a good window connection. Sometimes the inner lintel is changed to an arch (F217). The coupled window with two arches and a colonette in the middle is particularly typical of Lebanon. With slight modifications it is repeated countless times. As a rule there are two gracefully pointed horseshoe arches of the 3:4 proportion already described. Characteristic of these arches is the minute cut in the keystone (*qifl*) which brings the apex of the arch to a counter-curved point. Arches and window frames are kept plain and unadorned, but have a perfectly smooth finish with regular hair joints. The colonette always has a base and capital, usually with geometric decoration. Above the window a segmental arch relieves the window from the load of the wall (F218). The tympanum below the relieving arch is slightly recessed and decorated with small reliefs or ornamental cut-outs (F219). The complete window panel generally receives a horizontal cavetto hood-mould on top, which terminates flush at the sides of the panel with a right angled downturn and stylized palmette infill (F219, F220, F221, F222, F223).



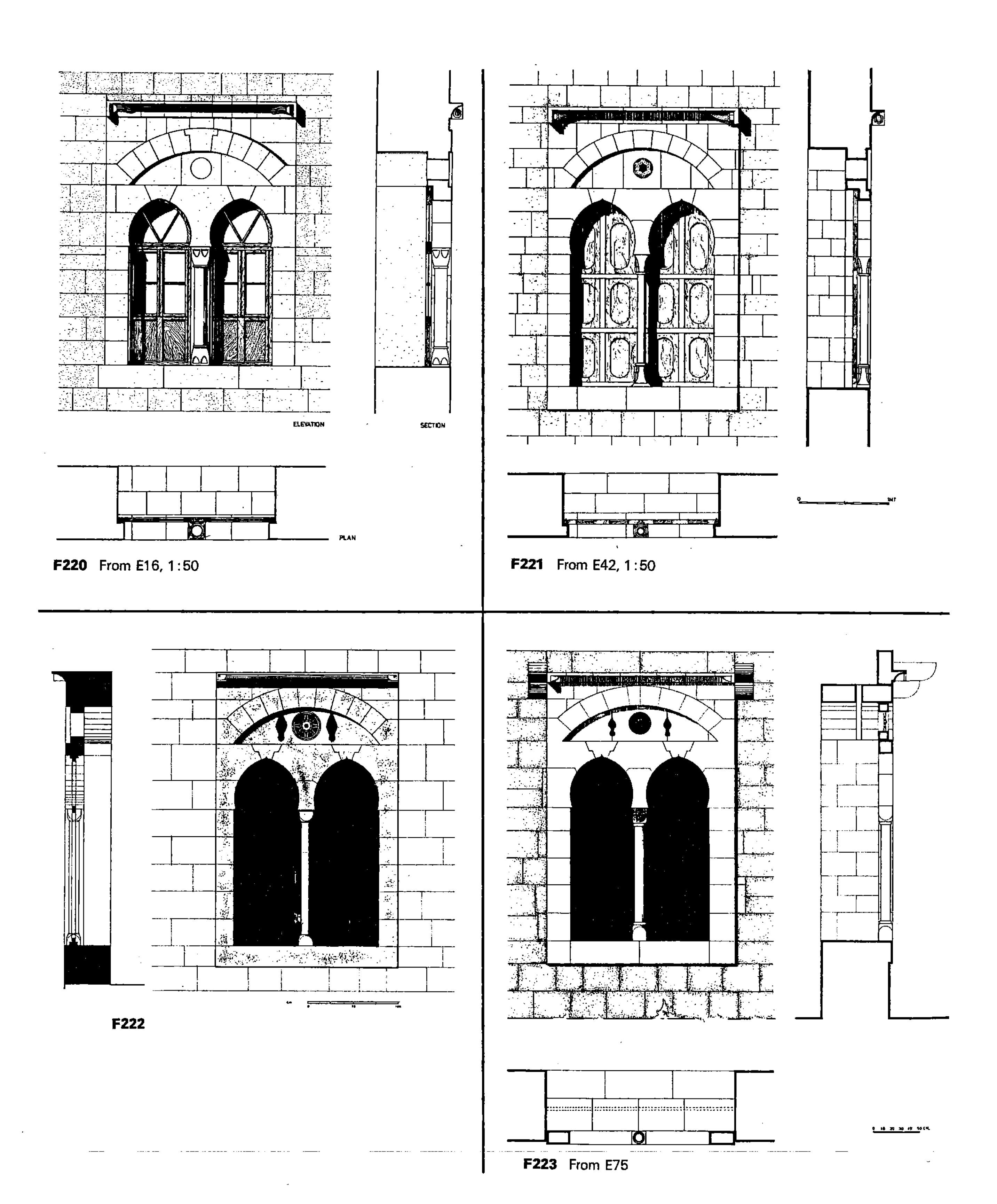
F217 From E7



F219 From E75 (see also F223)



F218 Moukhtara

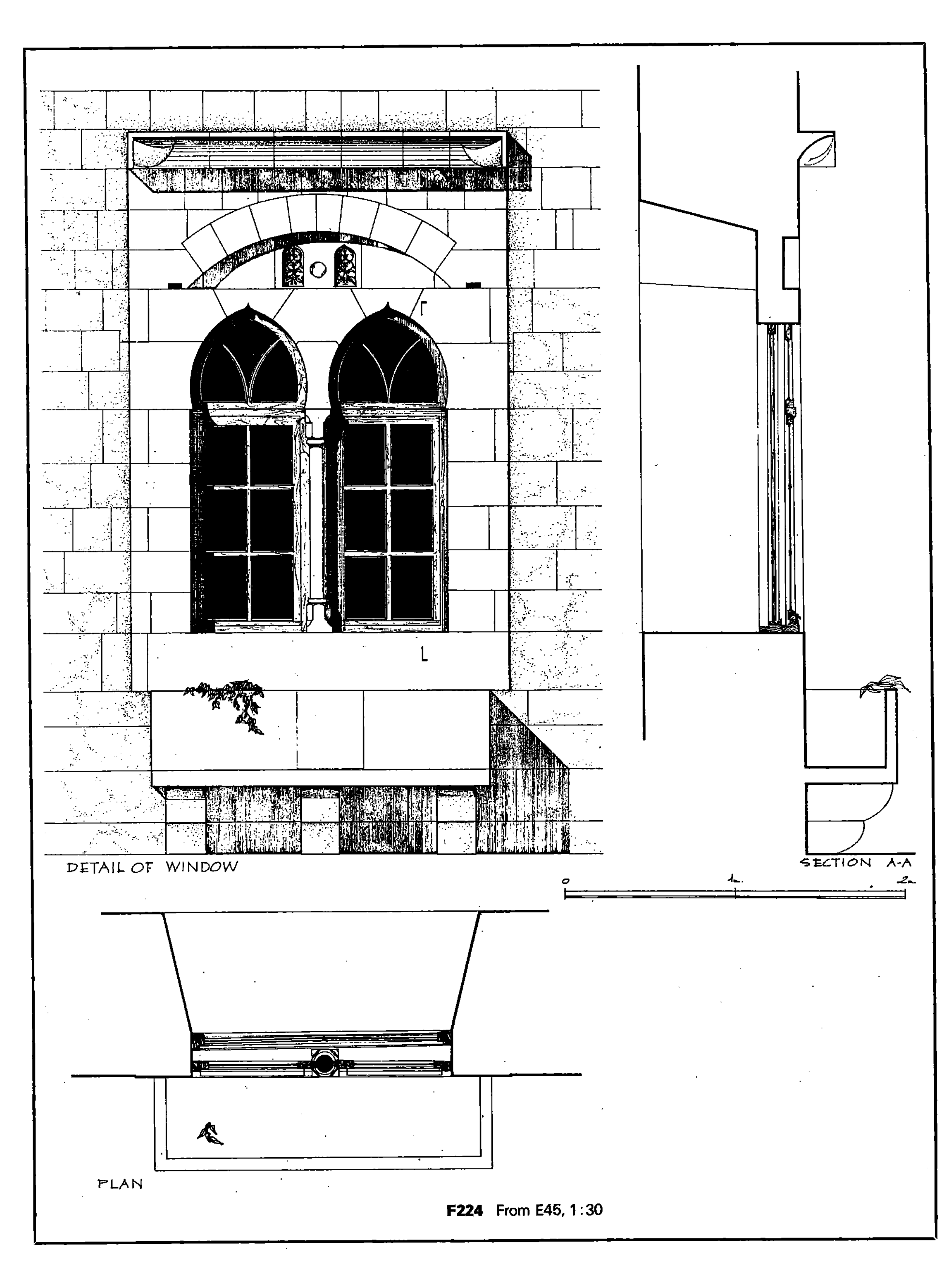


F220 From E16, 1:50

F221 From E42, 1:50

F222

F223 From E75



F224 From E45, 1:30

D. Windows with Planters

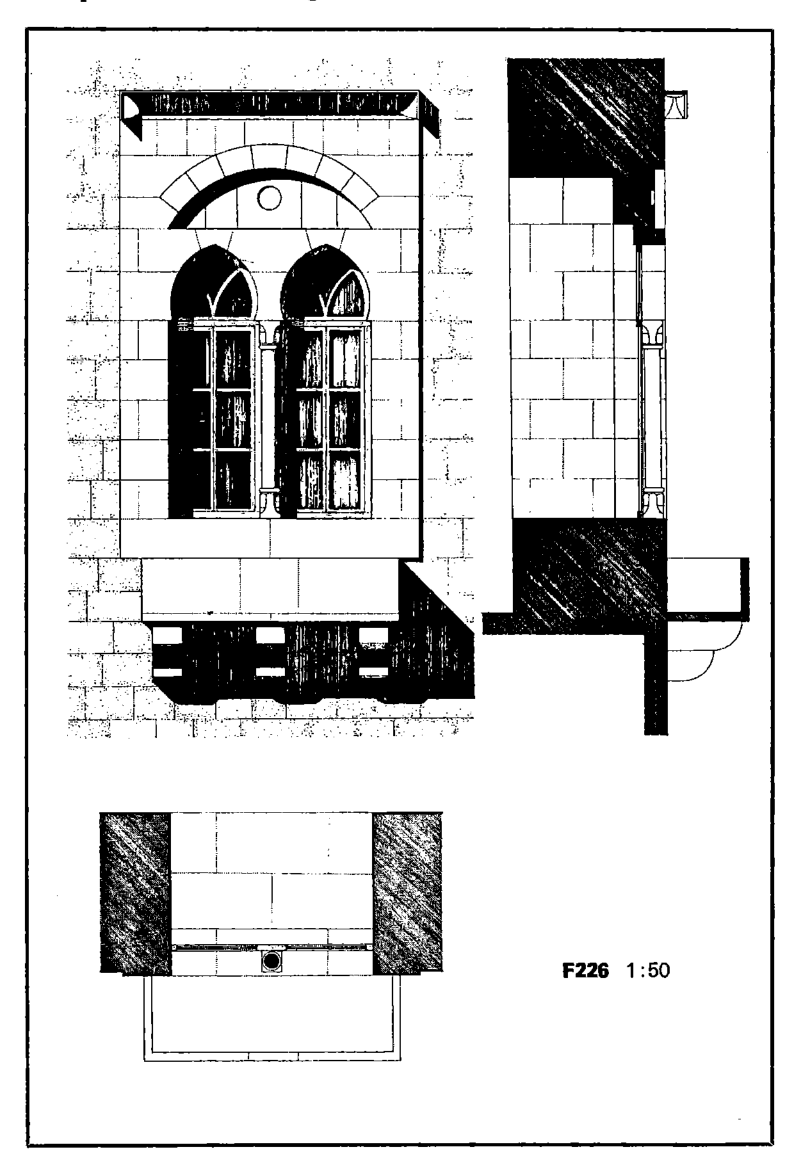
The projecting planter below the window is a very attractive feature. These window-boxes are about 50 cm. deep and 50 cm. high, consisting of 8-10 cm. thick stone slabs which rest upon stone corbels (F224-229).

The combination of windows and plant-boxes is very unusual in the Orient, and testifies to the Lebanese people's love of flowers.

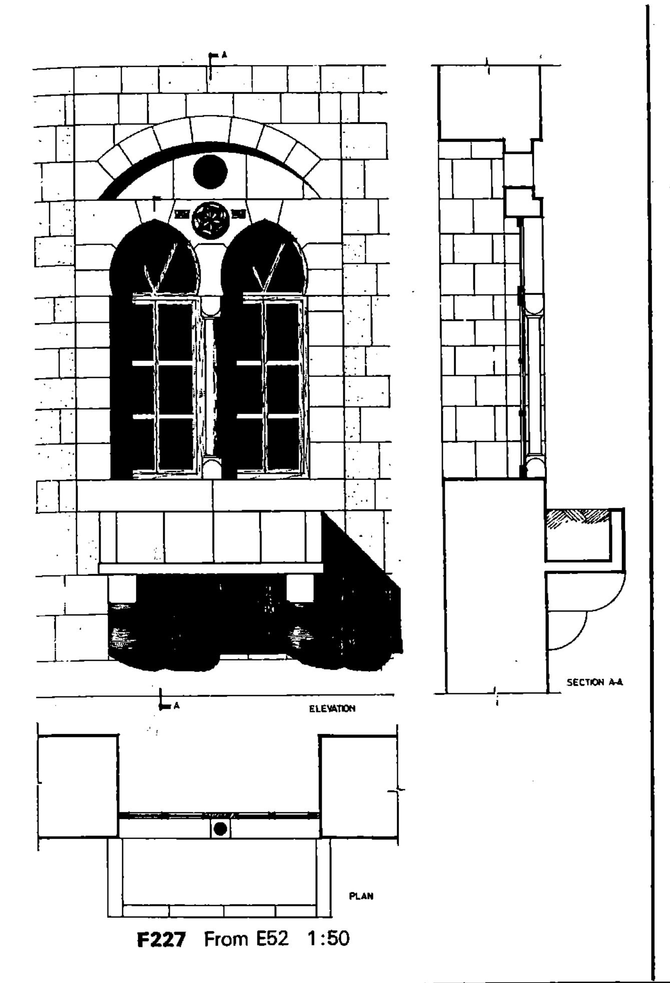
In coupled windows we sometimes find trefoil arches composed of suitably cut blocks of stone which are assembled as corbels without any arch action (F230, F231). Such windows may have a segmental hood mould somewhat resembling a broken pediment (F232). In exceptional cases the arch form is completely abandoned and the top of the window is composed of corbelling blocks of stone (F233).



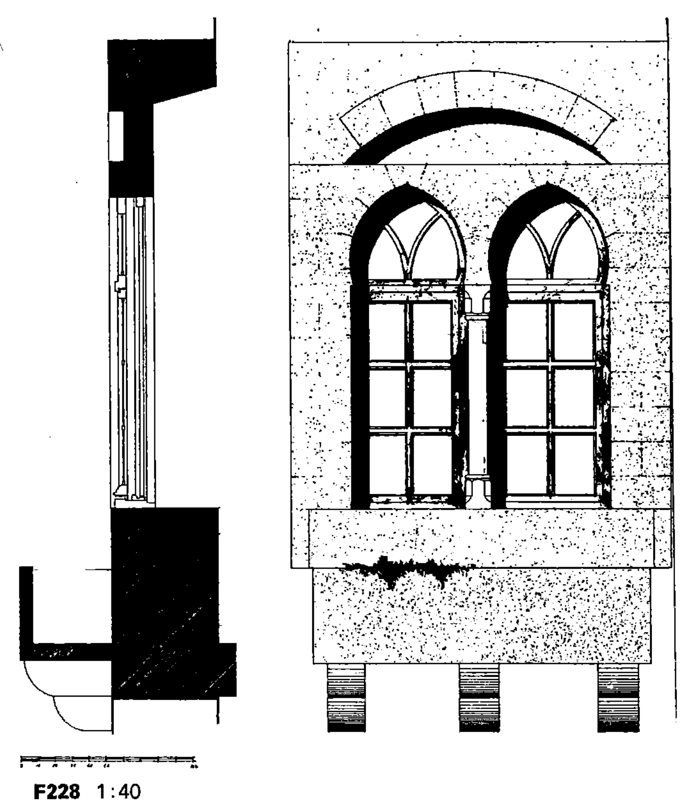
F225 Amatour



F226 1:50

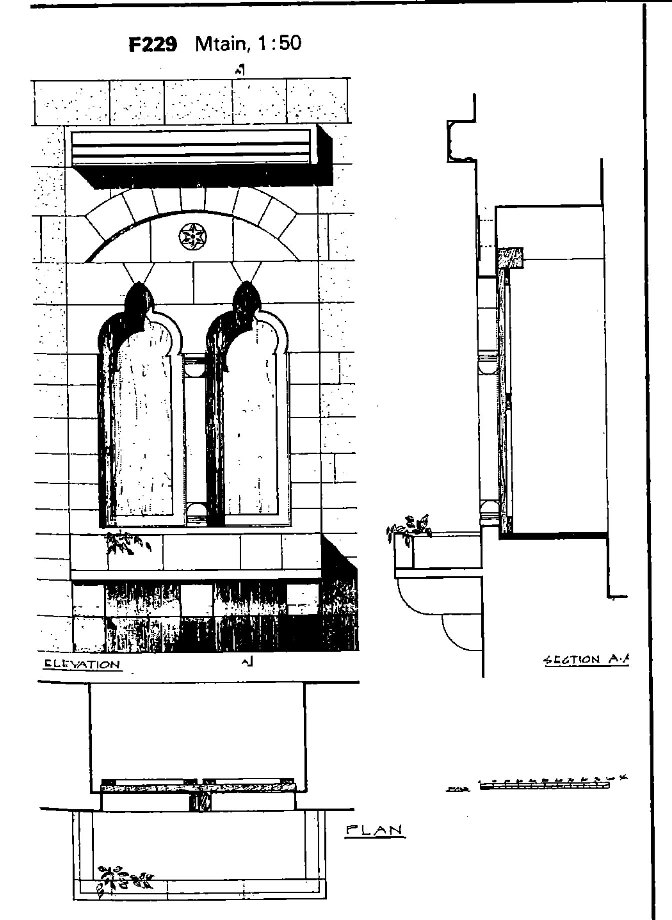


F227 From E52 1:50

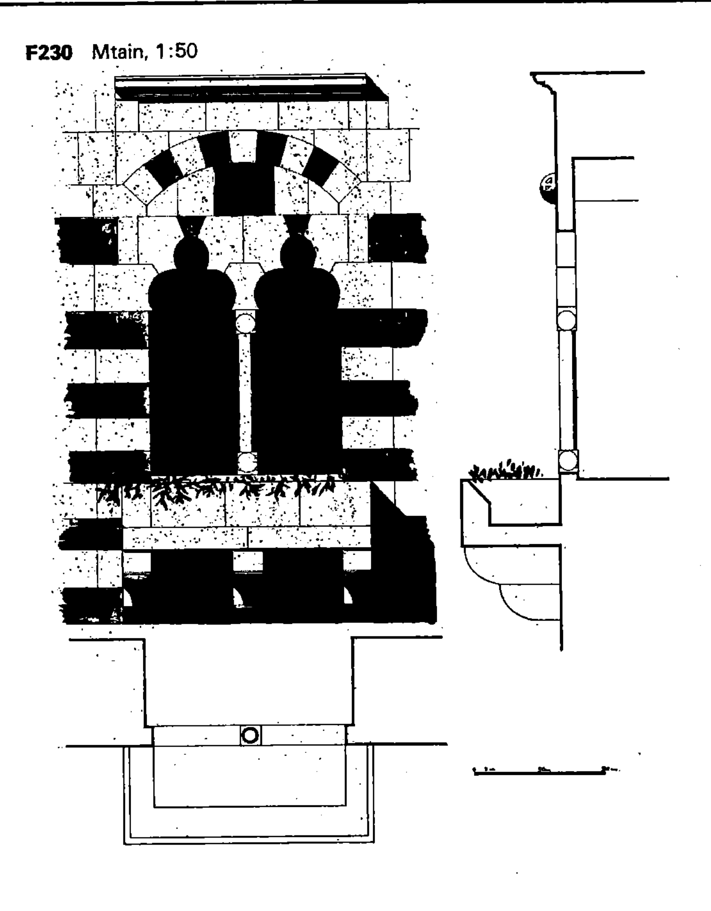


F228 1:40

F229 Mtain, 1:50

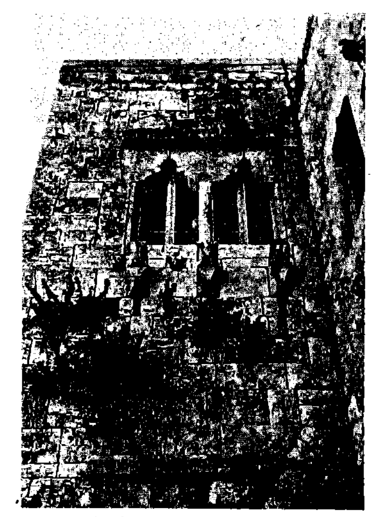


F230 Mtain, 1:50




F231 Amatour


F232 Moukhtara


F233 Amiun

E. High Windows

High windows serve mainly for ventilation, which is necessary for climatic reasons as well as a smoke outlet. Originally, when there was no glass, and windows were closed by wooden shutters during cold or stormy days, high windows also served for illumination. Often they consist of nothing more than a square hole in the wall (F75, F83, F115), but most frequently they are circular (F150, F151, F154, F157, F159), embellished with suitable decoration (F261, F263). Positioned near the ceiling, they are either placed in the middle of the room, high up between two windows, or on the center line of doors and windows. Round openings are often made in the spandrels above arches (F163). In the case of galleries such openings have only a decorative function (F93, F195, F198).

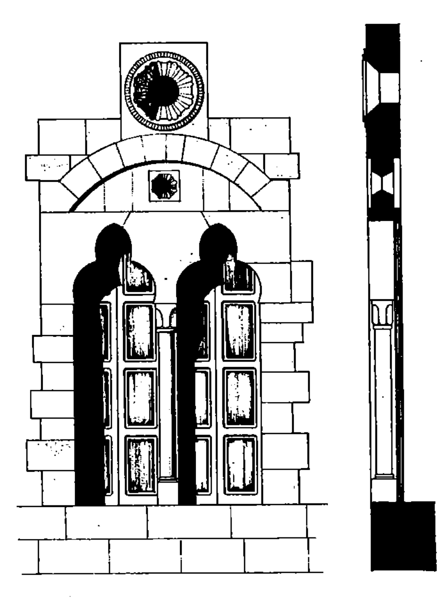
F. Combined Windows

As mentioned above, windows and high windows are sometimes combined to one design unit, examples of which are given in F234 and F235. The principle of grouping is also applied in F236 and F237, where three windows are combined, or in F238 and F239, where a coupled window is combined with a single window on each side. There are also interesting combinations of windows, doors and niches which are treated as complete interrelated designs (F240).

The levels of window sills vary considerably. Apart from the usual height between 80 and 100 cm. there are windows which have sills as low as 30 or 40 cm. This is a result of the oriental habit of sitting on the floor. A characteristic feature is the combination of a low window with a sitting platform. It is called a *mandalūn,* and may have developed from the rear part of a liwan which received a window (F241). The

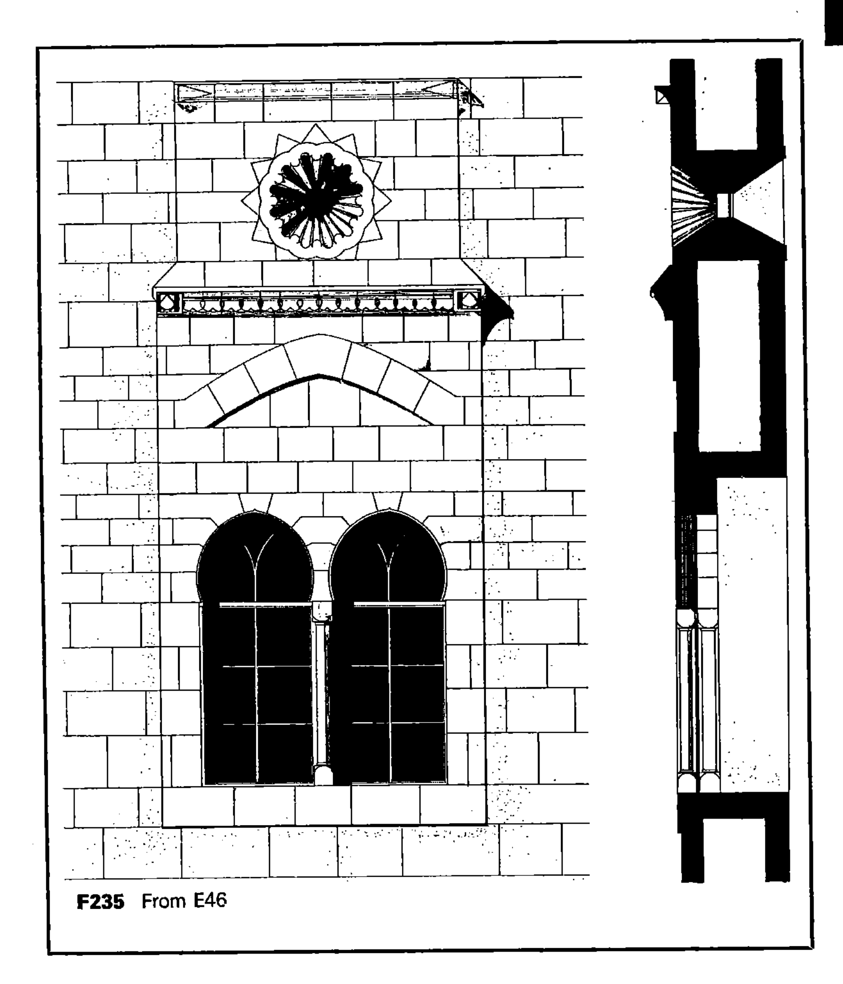
name is believed to derive from *mandolino,* Italian for a small lute which was often played in that window space.

Windows are protected where necessary by straight iron bars or equipped with iron balustrades (F242). Wrought ironwork does not have much artistic prominence in Lebanon. Neither do we find many of the intricate wooden screens (*msharrabiyyeh*) which are used in other Arab countries to shield the womens' quarters.

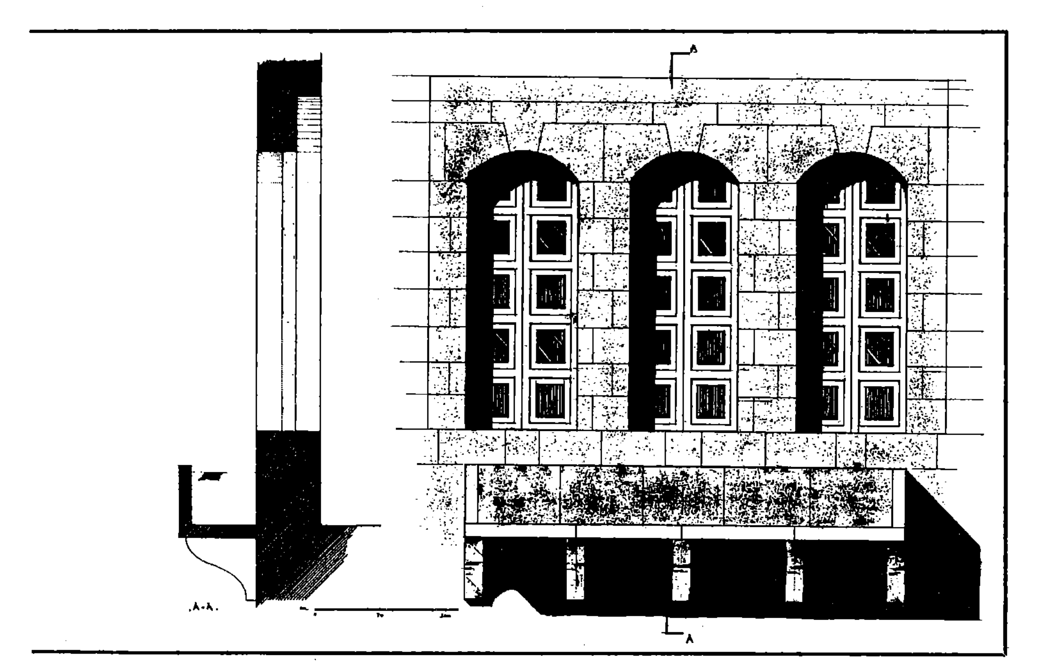




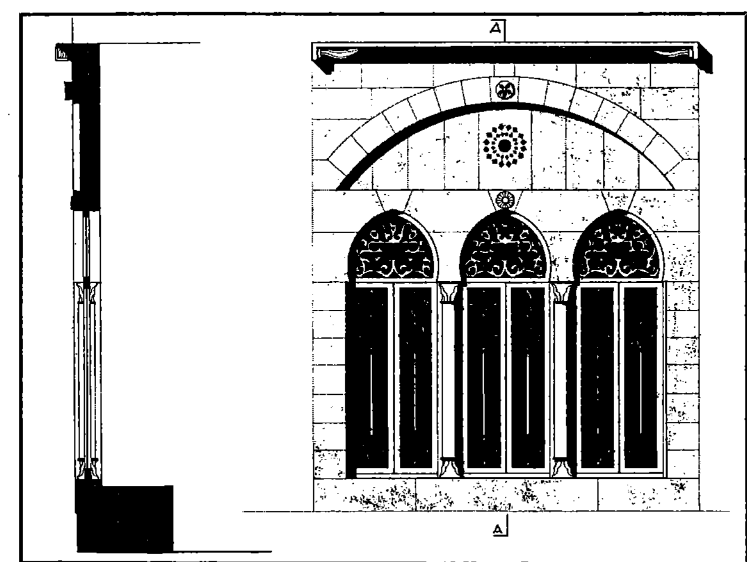
F234 1:50



F235 From E46



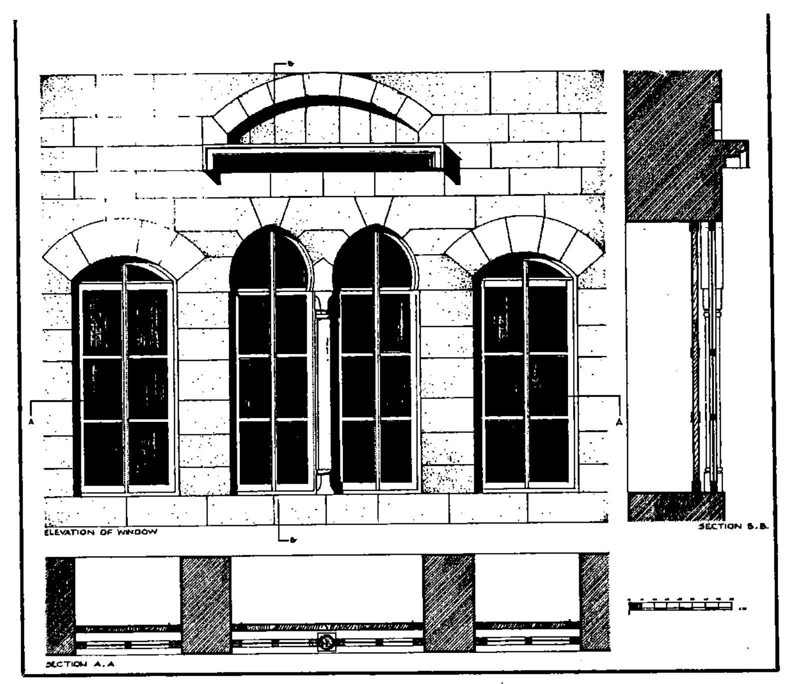
F236 From E73 1 : 50



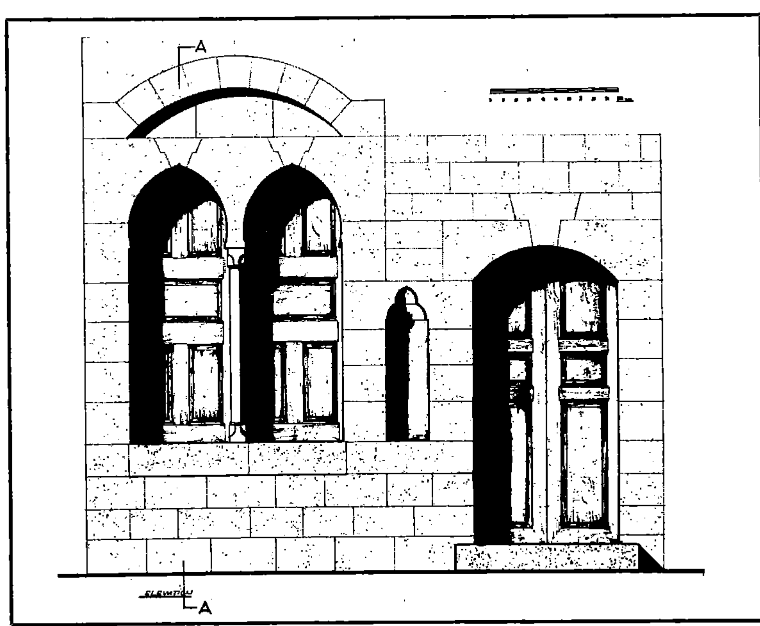
F237 1 : 50



F238 From E29 1 : 50



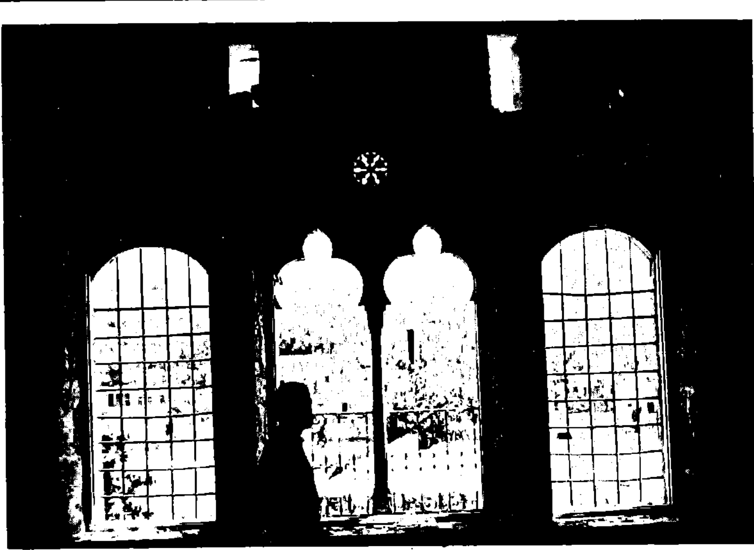
F239 From E31



F240 From E30



F241

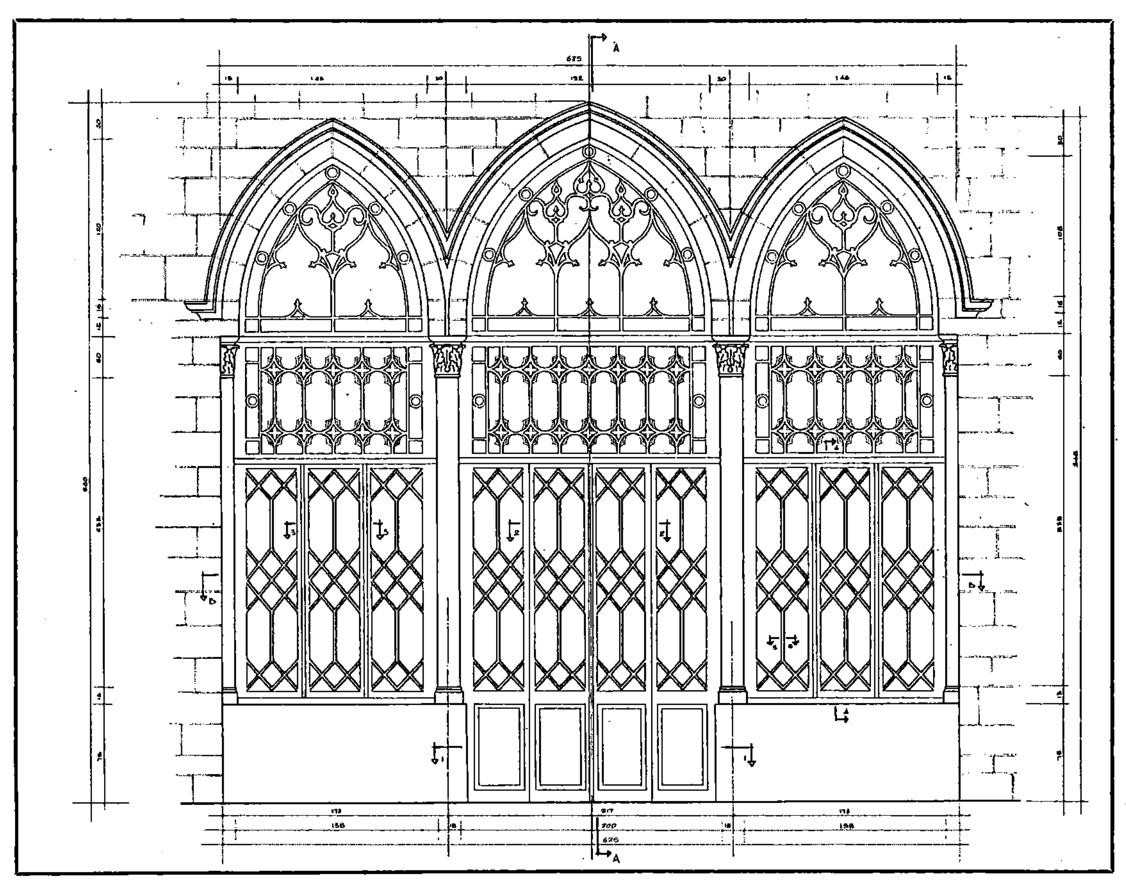


F242 From E29

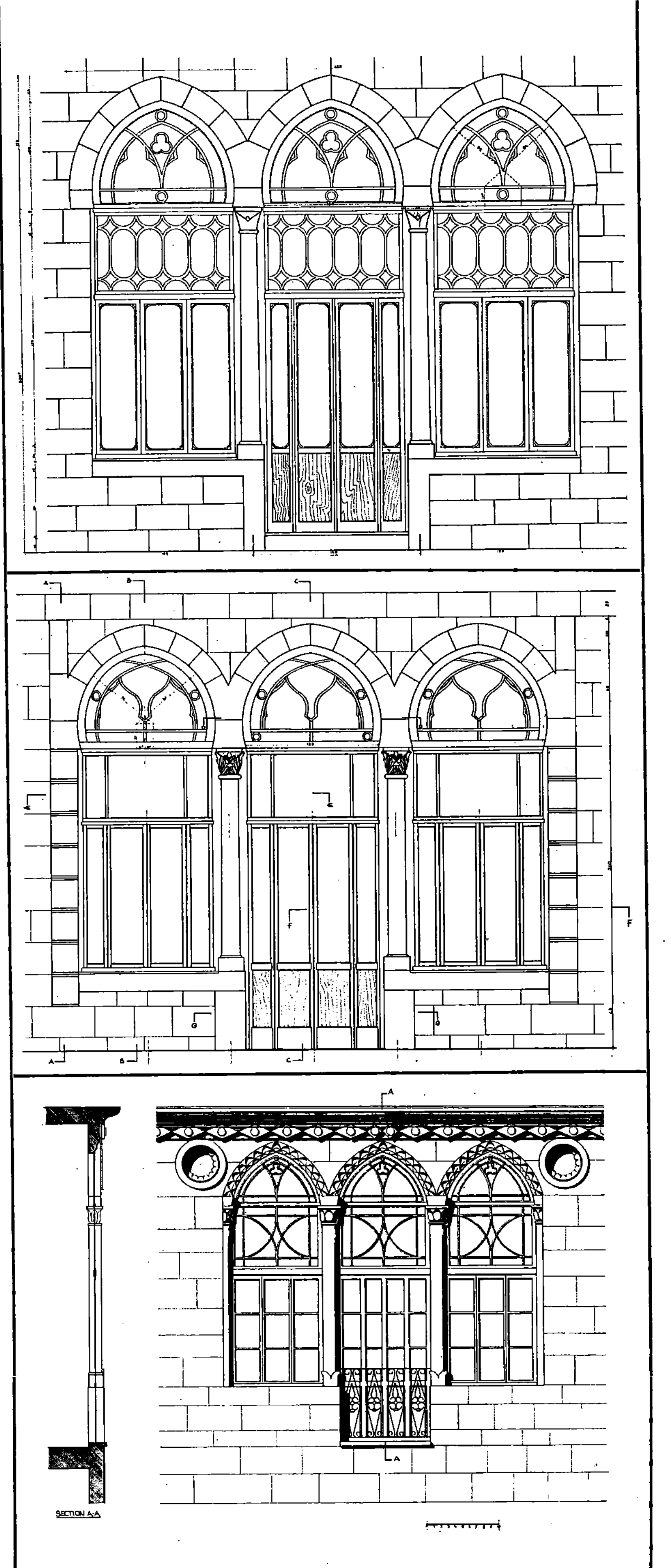
G. The Triple Arch

The triple arch in a way combines window, door and arcade. It consists of three arches which connect above slender columns, and on the sides either tie to the wall or are supported by half columns. Below the windows on the sides the walls continue, forming a parapet (F243, F244). If there is no balcony in front of the door, an iron railing is erected to protect the opening (F245). The three arches are either of identical width (F243 to F245), or else the arch in the middle is a trifle larger (F246, F247, F249). In the second case the middle arch is either depressed (F246) or rises to a greater height than the side arches (F247, F249). If necessary the triple arch is extended to four or even five arches (F248).

In general the arches are plain and without any moldings. Only in the late period are hood moulds carried parallel to the arches (F249). The capitals of the columns receive predominantly foliage designs. Originally, the triple arch remained open. Only when sheet glass became available were the openings glazed by means of wood frames which were fitted to arch and column. Usually each light is subdivided by decorative mullions which are sometimes very intricate and patterned with multicolored glass (F247).



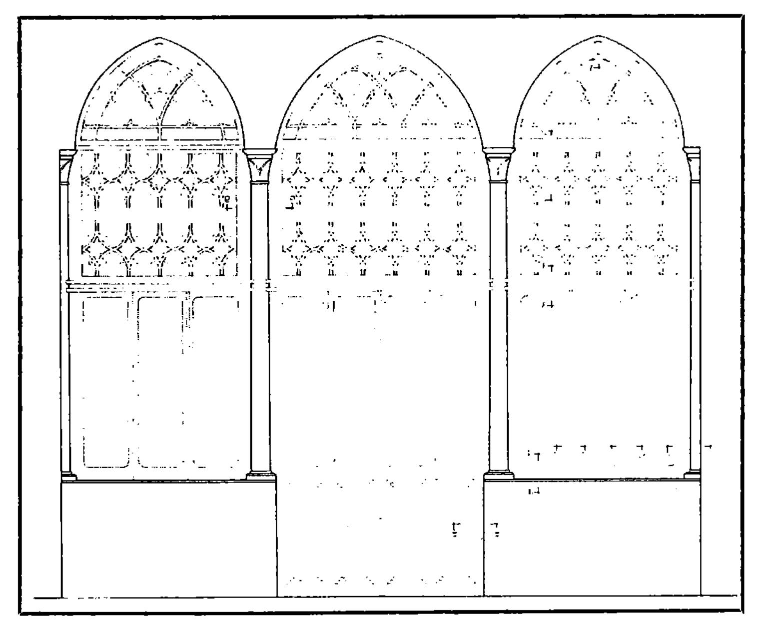
F249 House Zabouni, Beirut



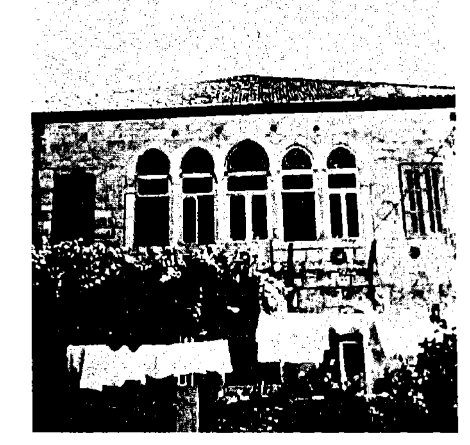
F243 From E69 1 : 50

F244 Mtain 1 : 50

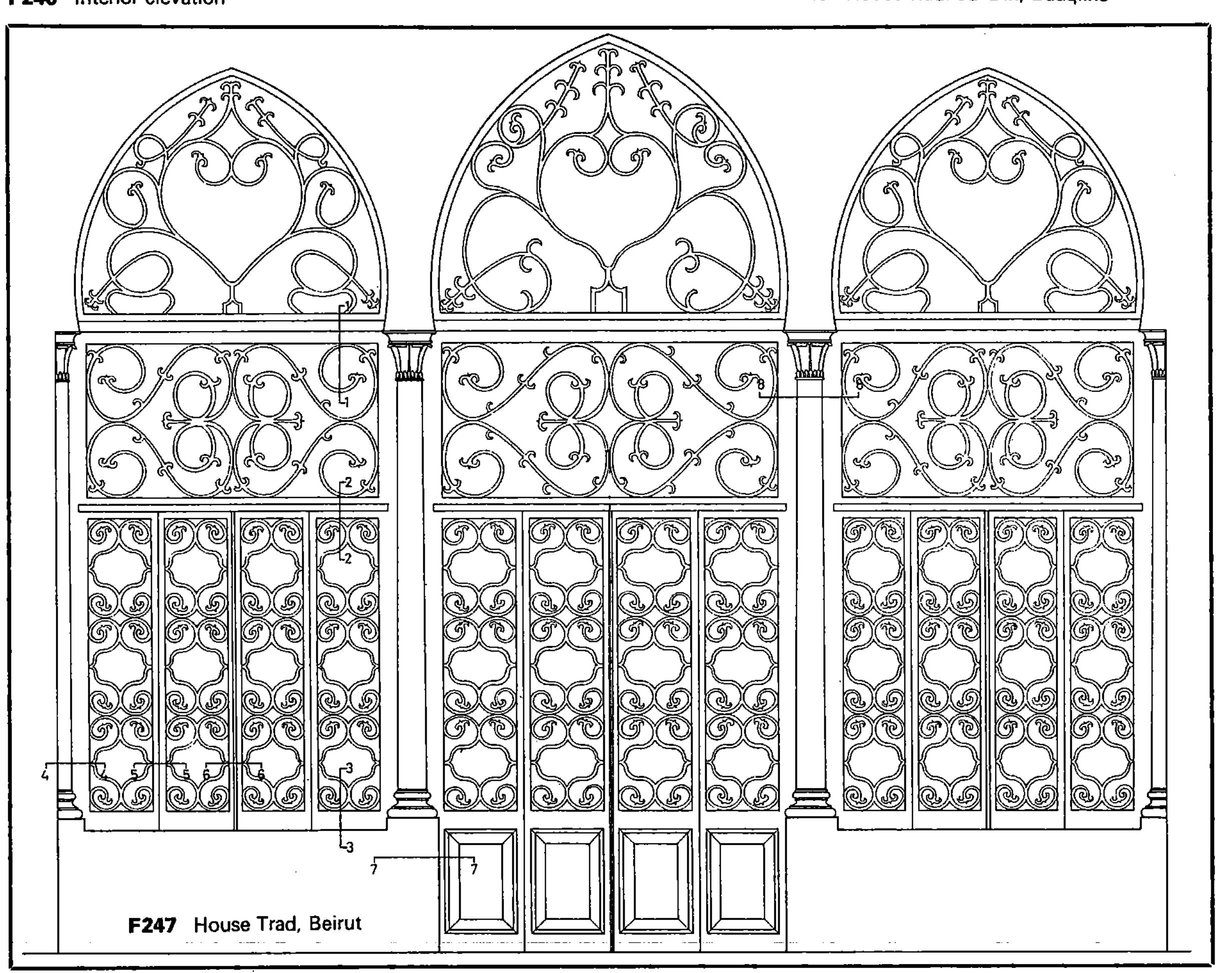
F245 1 : 75



F246 Interior elevation



F248 House Radi ed-Din, Baaqline

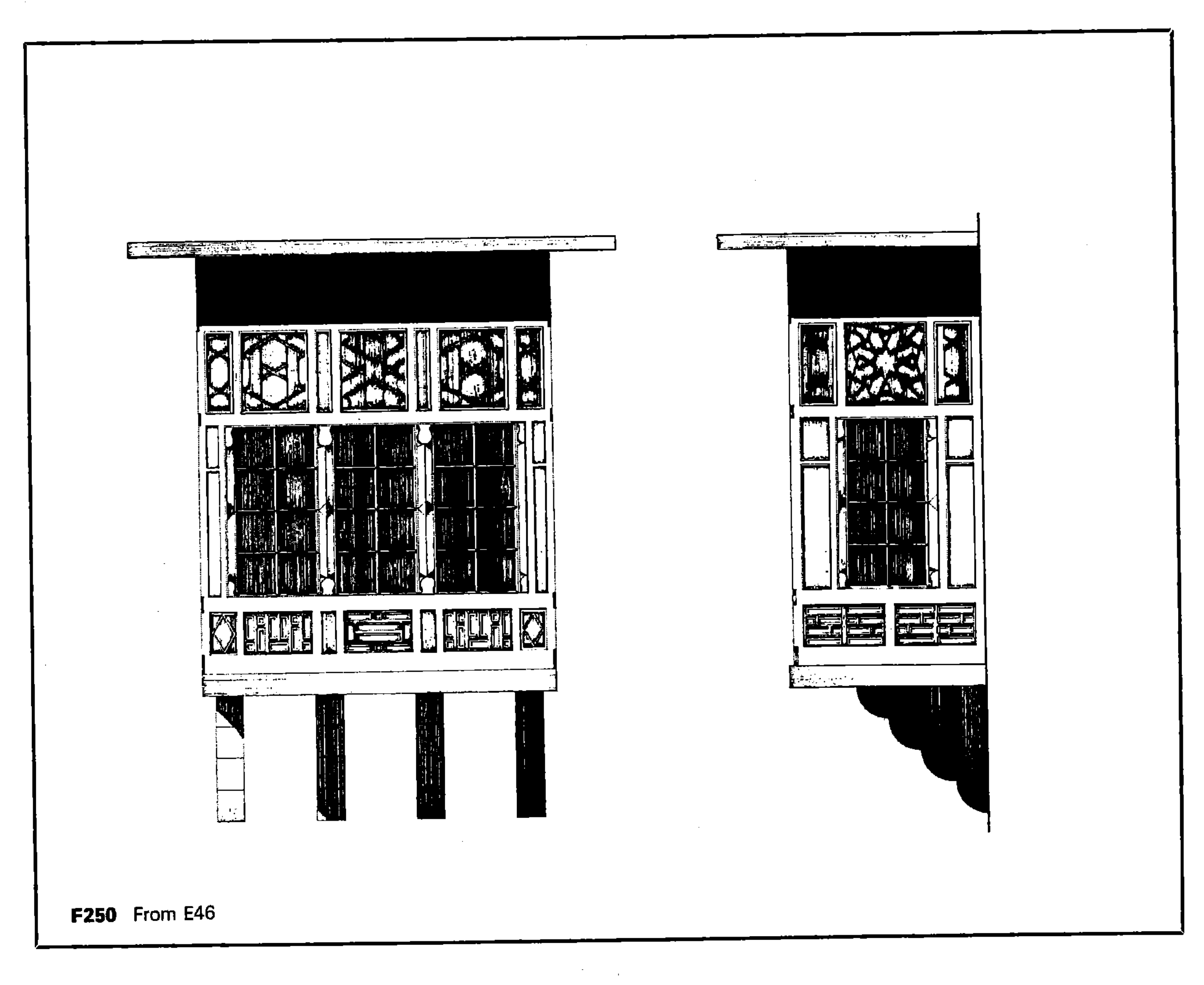


F247 House Trad, Beirut

5. MISCELLANEOUS DETAILS

A. Bay Windows

The use of bay windows, which served originally as screened lookouts for the harem, is very widespread in Arab city architecture. They are not, however, very common in Lebanon, where they were unnecessary. Only in important palatial buildings do we find bay windows, similar to the *kiosk* in Turkish architecture, which usually marks the seat of the most important person in a reception hall (F250). Walls and roof are composed of wood, and the whole structure rests upon stone corbels. Because they need constant maintenance the roofs and floors today are replaced in concrete.

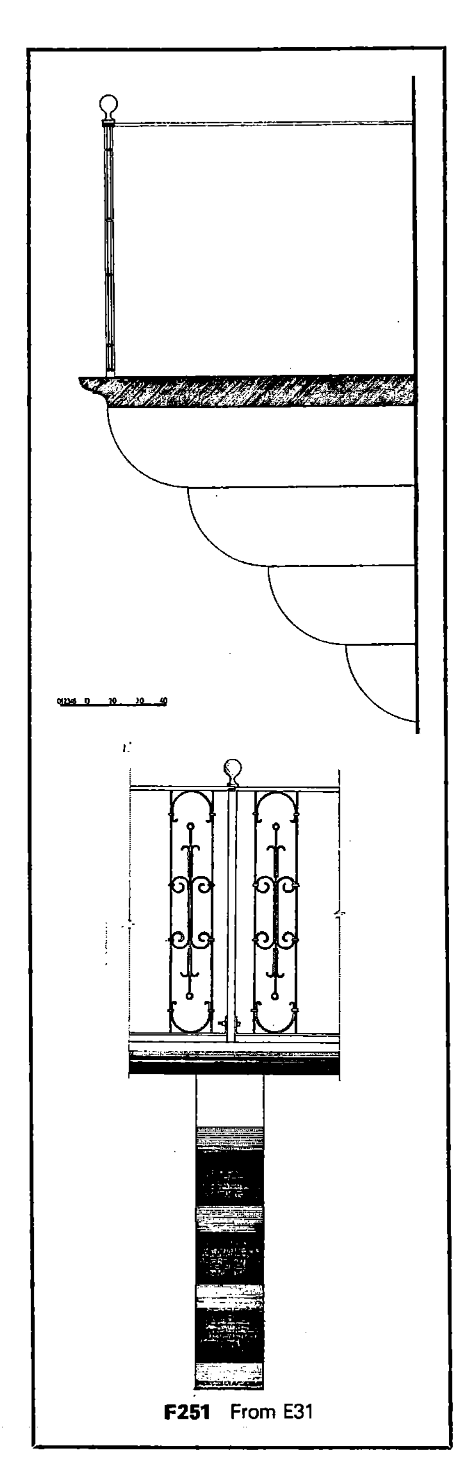


F250 From E46

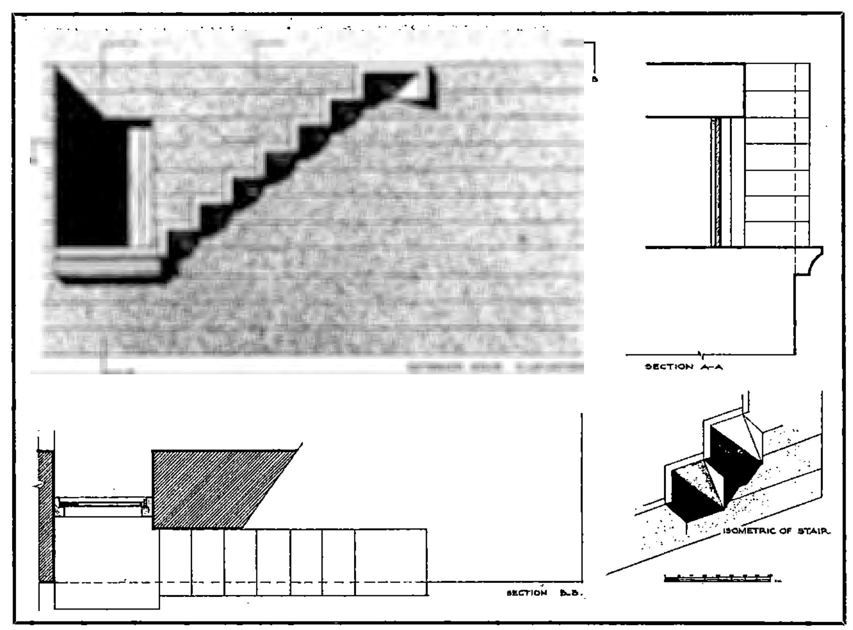
B. Cantilever Stairs and Balconies

The various cantilever designs in stone are very attractive. Cantilever stairs such as those shown in F251 or F255 are frequently to be found; the steps are of monolithic pieces of limestone, tied into the walls of about 50 cm. thickness and projecting up to one meter (F15, F102, F255). The ends of the steps are usually cut into interesting geometric shapes.

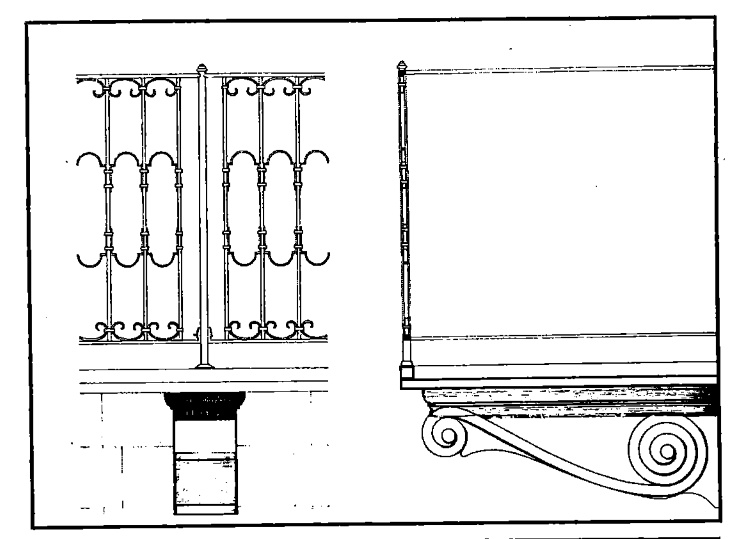
Balconies (*shurfāt*) consist of 5 to 10 cm. thick stone, usually marble slabs. They rest upon corbels (*zifr*) placed at about one meter distance and projecting up to 1,20 m. Depending on the quality of the stone, the corbels either consist of several ranges above each other (F251, F255), or are a single block with scroll decoration (F253, F254). The wrought iron railings are set in leaded holes, and sometimes stiffening rails are carried up overhead and connected to the wall.



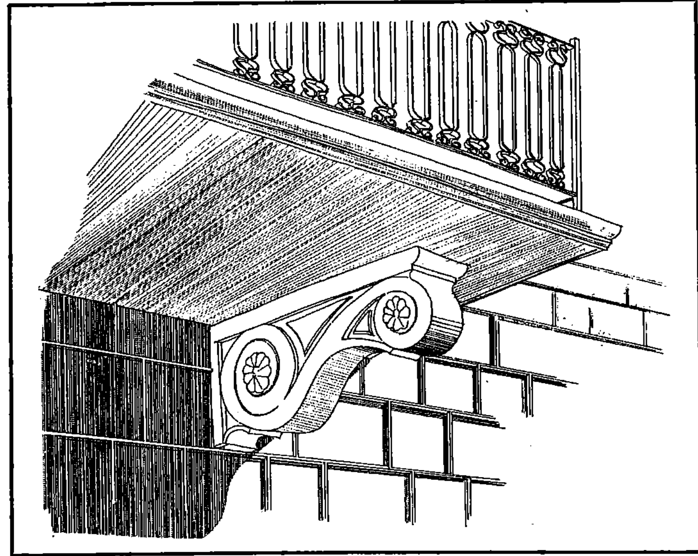
F251 From E31



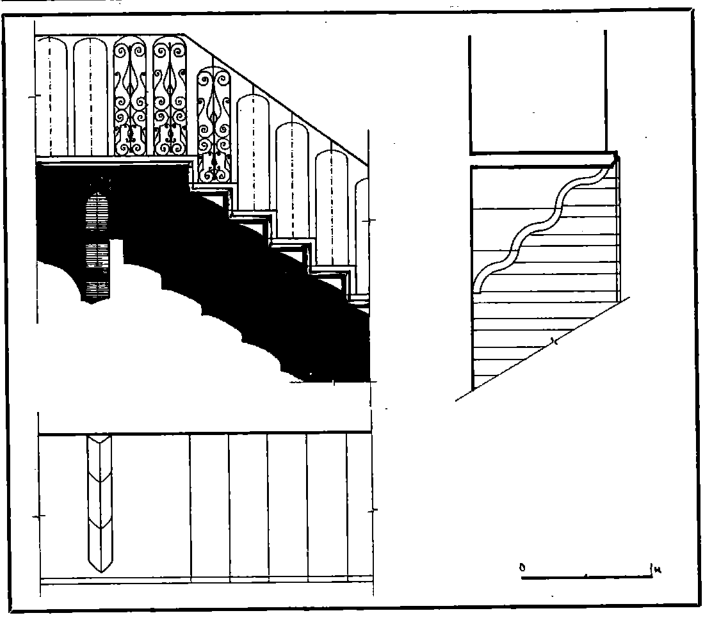
F252 From E70



F253 From E65



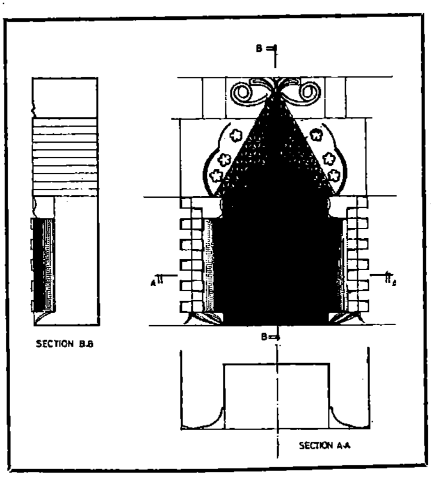
F254



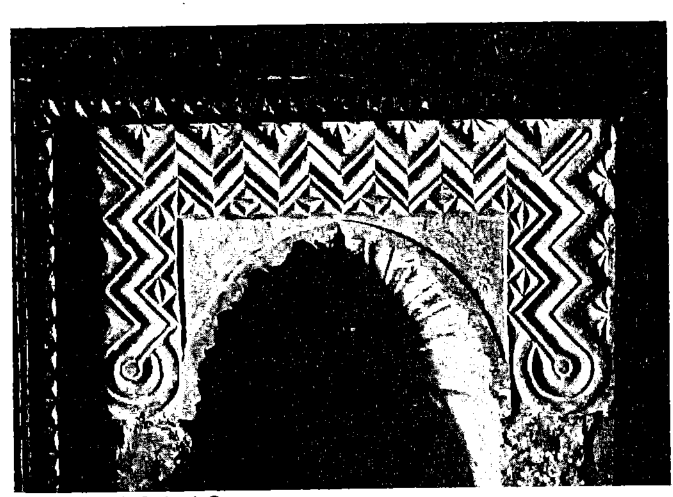
F255 From E73

C. Niches As for niches, small individual recesses cut into the stone walls to receive candles, lamps and other miscellaneous objects, these are found inside rooms along gallery and court walls and offer a great opportunity for the stone-masons to demonstrate their skill in design and workmanship. It is interesting to see that at the purely decorative level the Arab-Islamic influence is strongest, although many details can be traced back to medieval moukdings. For instance, the jambs of F256 resemble a Romanesque billet moulding, the wide zig-zag ribbon in F257 is similar to a chevron pattern, and the dark narrow band around it is a modified nailhead strip. The beautiful screen on top of the niche in F258 is skillfully undercut and looks like pierced diaper work.

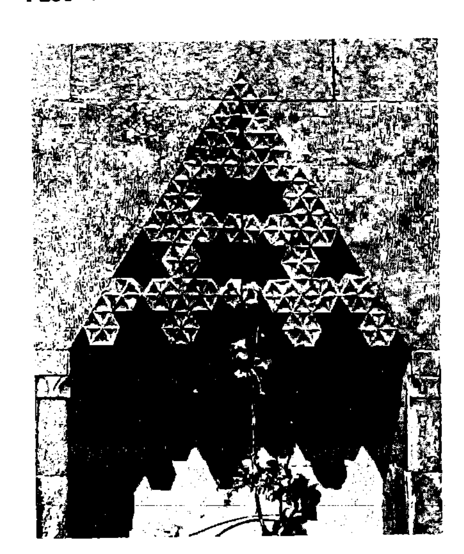
Truly Arab in character are the niches shown in F259 and F260. Certainly the quality of workmanship and the abstract geometric design are outstanding. Often one finds exquisite examples in otherwise simple and modest houses.

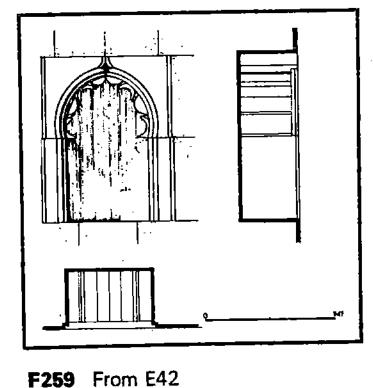


F256 From E42



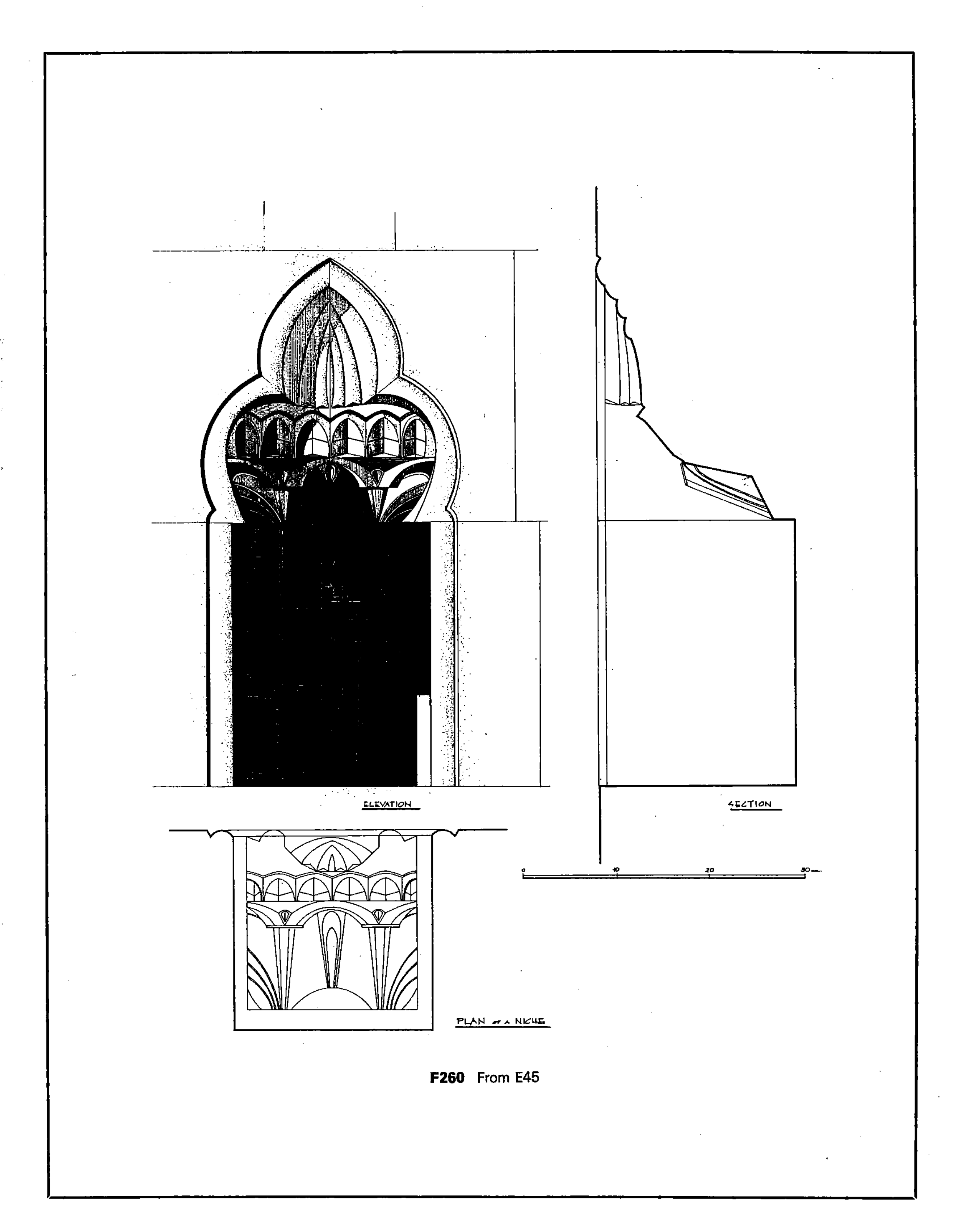
F257 Serail, Deir el-Qamar





F259 From E42

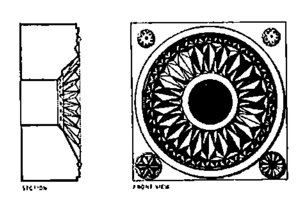
F258 Amatour

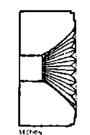


F260 From E45

D. Circular Openings and Rosettes

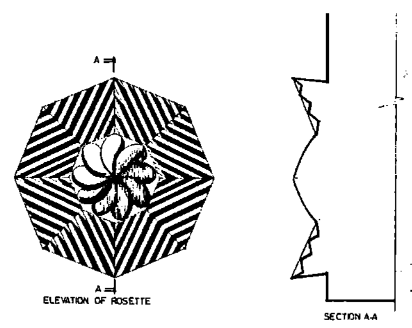
The same spirit of decorative inventiveness is displayed in the design of pateras, rosettes and circular openings (F261-265). Sometimes keystones also are distinguished by embellishments such as those seen in F262 and F266. A special feature is the high relief design cut hollow and pierced entirely out of one block, resembling medieval bosses, as for example in F266.



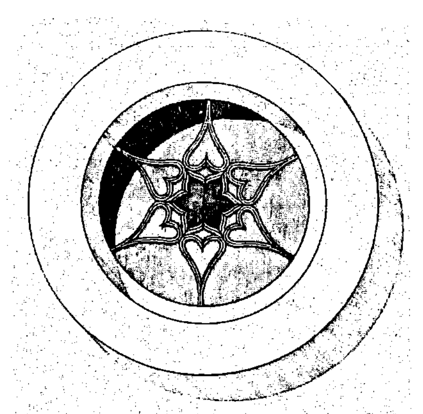




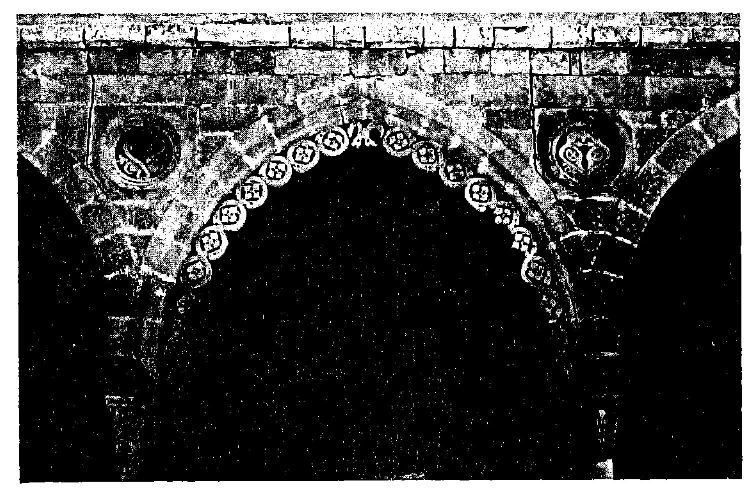
F261 Baaqline, 1:25



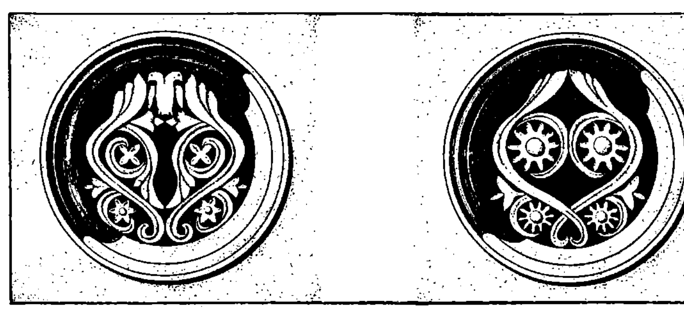
F262 From E37, 1:5



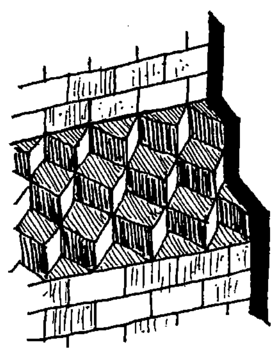
F263 House Trad , Beirut



F264 From E29



F265 Details from F264, 1:5





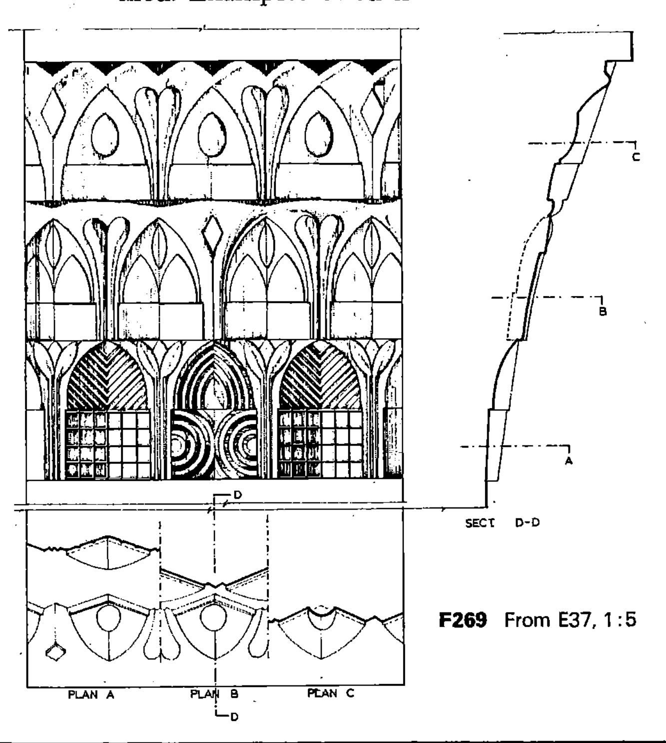
F266 Amatour



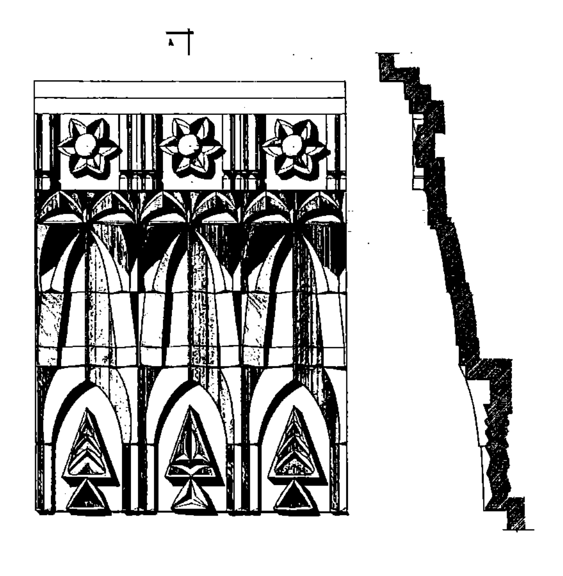
F268 Emir Amin palace, Beit ed-Dine

E. Impostblocks and Consoles

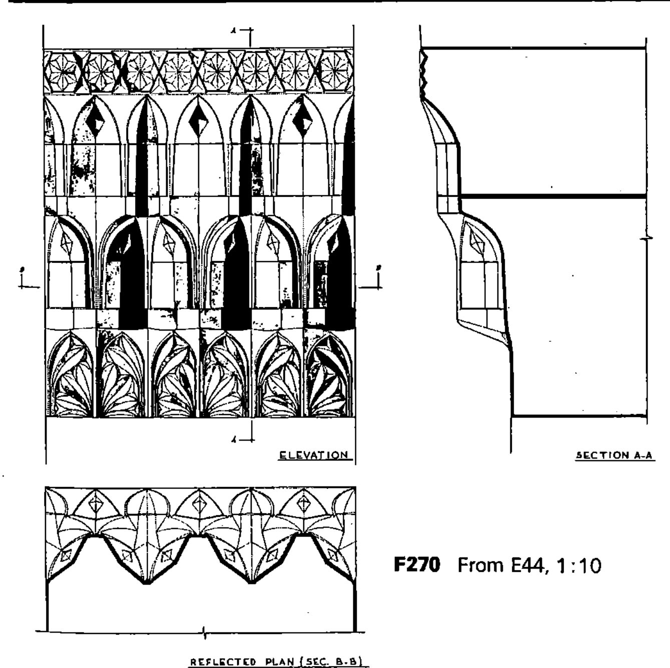
Arches which are supported by walls, as in liwans, usually rest on projecting impostblocks which carry stalactite decorations. The origin of the stalactite patterns is believed to come from Mesopotamian brick construction, where corbels were restricted to progressively projecting brick courses, often placed over edge[54] (F267). Eventually highly complex patterns developed from this practice, which were later transferred to stone construction as purely decorative features. They consist of multifacetted, usually undercut, surfaces which are called *mqarnas* in Arabic, meaning uneven, wrinkled. Examples of such work are shown in F268-272.



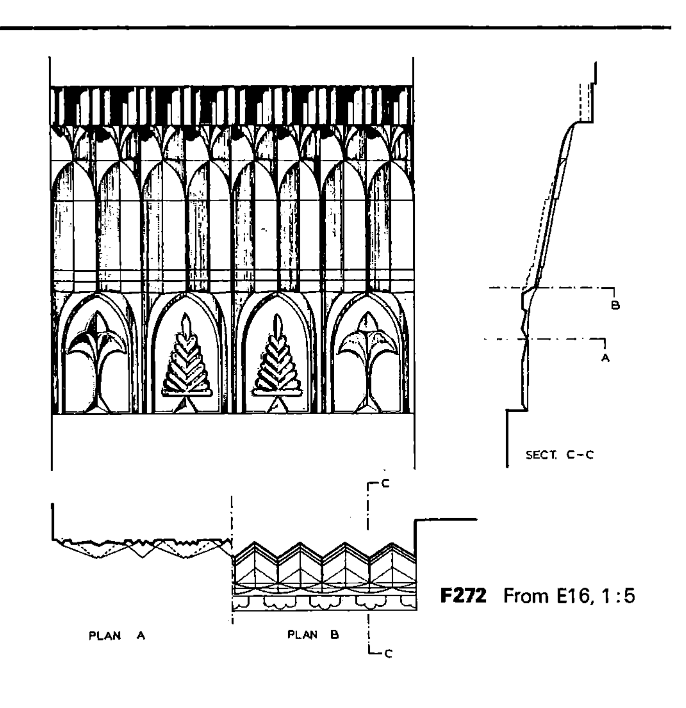
F269 From E37, 1:5



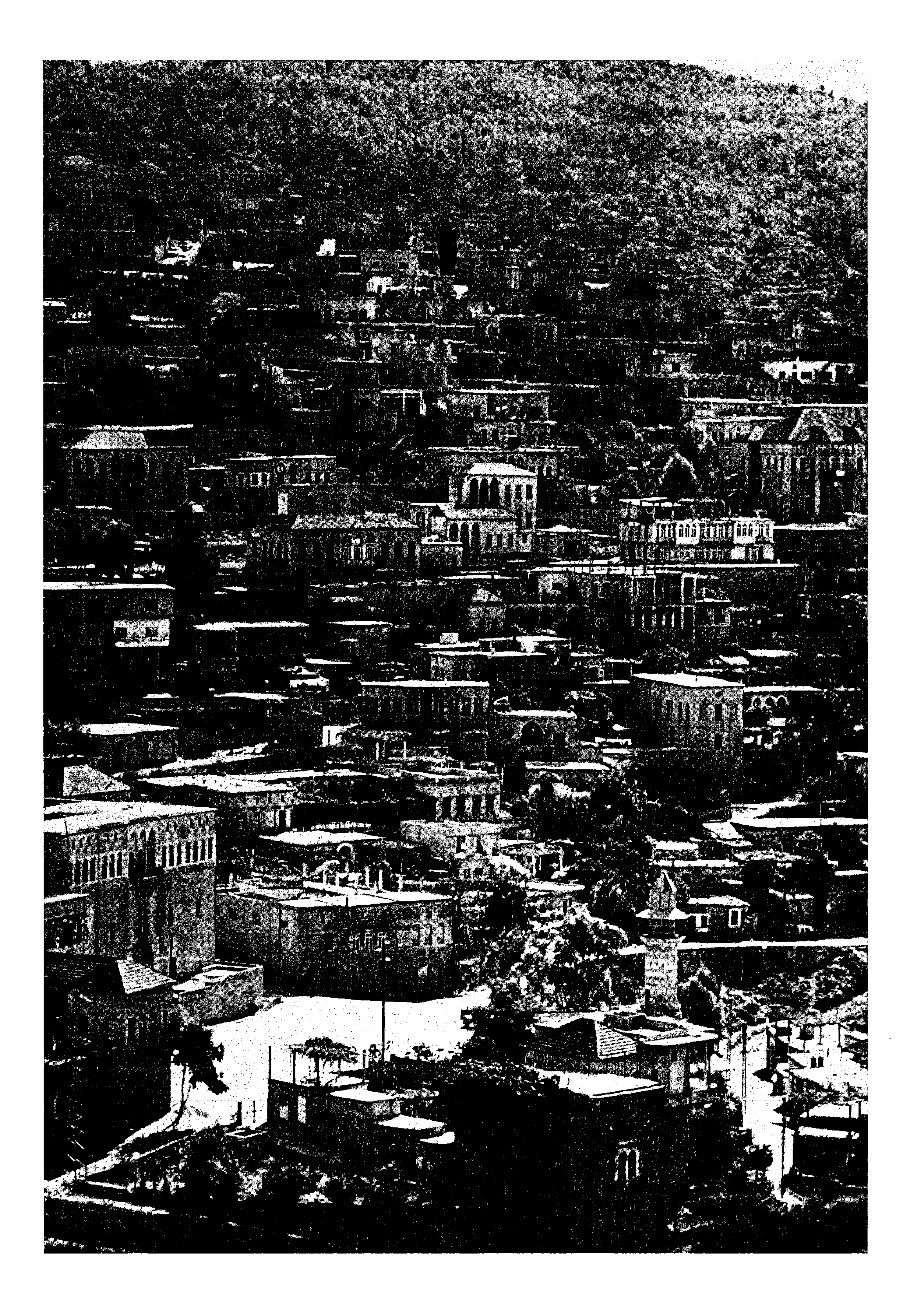
F271 From E43, 1:5



F270 From E44, 1:10



F272 From E16, 1:5



IV

CRITIQUE OF DOMESTIC ARCHITECTURE

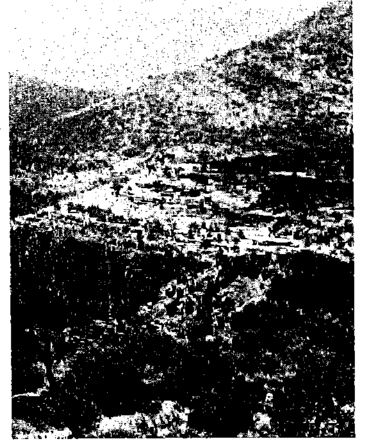
F273 Hasbaya



F274 Qnat



F275 Hadchit in the Kadisha valley



F276 Damour valley



F277 Jezzine

1. SINGULARITY AND DEPENDENCY OF RESIDENTIAL ARCHITECTURE

In this chapter we shall try to answer the question how much the Lebanese house is an indigenous solution to the specific conditions of Lebanon and to what extent it is the product of foreign influences. This question has already been referred to in the discussion of the origins of the various house types, and we shall now examine comprehensively the influence of the various factors which bear upon the formation of architecture as identified in part I. Although the examples upon which this study is based do not comprise a systematic survey of the whole country, still they may be regarded as a representative selection of house types.

A. Geography

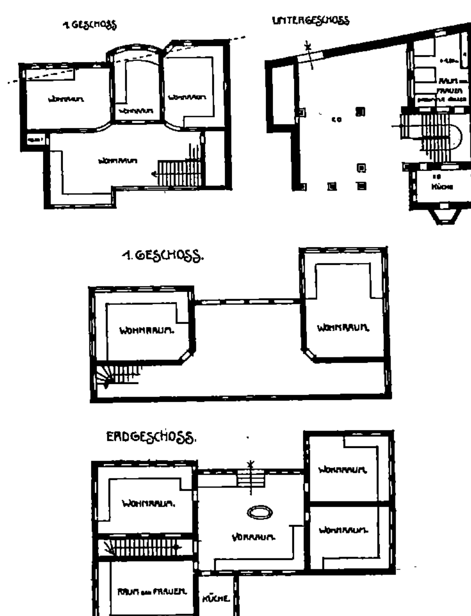
The influence of geography can be observed in the adoption of certain types of construction and the arrangement of the houses. In the *Beqa'a* the grouping of closed rectangular houses predominates; the detached house is rare. This was primarily caused by the lack of security, which in turn was the result of the location in a plain and the geographic position of the *Beqa'a*. (The *Beqa'a* was an important inland route in the north-south direction, and thus open to frequent incursions, while the coast was not suited for land traffic, and sea communication was controlled by the coastal cities.)

On the western slopes of the Lebanon range we find, in spite of the articulated formation of valleys, the same variety of house types everywhere, and the mountainous character of the land determines house form and house orientation. The arrangement of plans and access ways, the elimination of courtyards, the cubic simplicity of masses and the habit of two-storey construction, the treatment of facades and the preference for detached construction, are largely caused by the steeply sloping sites. The singularity of the Lebanese house is to a large measure due to this topographical condition (F273-277).

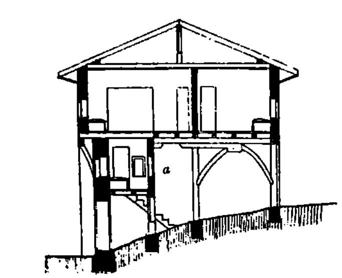
We can also observe the effect of the regional situation of Lebanon. The country lies in the midst of many interregional influences from which it has never been isolated, and numerous conquerors have occupied it. However, we must distinguish between the strategically essential coast and the less important mountains. The Lebanon range was of interest only to western conquerors, since control of the mountains meant protection of the coast. This is why we find mainly Roman and Frankish vestiges in the mountains. Oriental powers, on the other hand, could afford to grant a certain measure of independence to the mountaineers and did not hinder their trading activity via the harbor cities, from which activity everybody profited. Thus a sort of "splendid isolation" enabled the Lebanese of the mountains to make or to avoid contacts at their discretion.

Considering the 400 years of Turkish domination, it is surprising to note how limited the influence of Turkish architecture is, particularly as far as domestic buildings are concerned. This is mainly due to geophysical differences. Since many parts of Turkey have a good supply of timber, the typical Turkish house consists of a timber frame structure, with, as a result, a proliferation of projecting parts: bay windows, wide eaves, irregular plan (F278, F279). This description of the Turkish house by H. Wilde[55] illustrates the difference in design to Lebanese houses: "Considering the oriental living habits, Turkish builders concentrated on the decoration of floors and ceilings. The exposed timber structure of the lower floor usually is not decorated. The section given in F279 shows a sub-floor with braces similar to those supporting bay windows (F280). A saddle roof with purlins, king-post and tie-beam covers the house. The ridges of the saddle roofs are kept parallel to the streets. Never does a house turn its gable to the street."

Similar evidence is furnished by R. Riefstahl[56] and G. Goodwin.[57] In conclusion we may say that, although Lebanon has been exposed to many influences as a result of its geographical position, its architecture retains a remarkable character of its own.



F278 Floor plans of a Turkish house



F279 Section through a house in Brussa



F280 House at Birgeh

B. Geology and Building Materials

Mud construction is limited to the *Beqa'a* valley, as a result of its geological condition. Otherwise the abundance of stone in the whole country offers the opportunity for good masonry construction. Depending on local conditions, either limestone, sandstone or basalt are predominant. Certain kinds of sandstone, particularly in the Beirut area, are so porous that they require plastering to withstand the weather. This practice became widespread at the turn of the nineteenth century and traditional masonry joints were imitated in plaster, often producing very poor results. At that time — the first expansion of Beirut — good sandstone was so much in demand that it was even shipped in from Latakia.

The availability of stone and its continual use for construction produced families of stone-masons who passed on their accumulated skill from generation to generation, evolving a mastery and tradition of design in stone which is largely responsible for the homogeneous character of Lebanese architecture.

Rough wood of medium quality was available for the construction of short span roofs while dressed timber for roof framing and veneers had to be imported, as was the case for roof tiles. Their occurrence gives important clues for the dating of buildings.

C. The Climate

Climate is one of the most powerful factors in the shaping of a regional architecture. In an area in which customs, philosophical concepts and also the way of building are determined by large, open, dry and hot steppes or deserts, where settlement means crowding around an oasis and the alternative is the nomadic life, the Lebanon, by contrast, constitutes an inviting mountain retreat, where everybody can find everything to lead an independent, if modest, life. The architecture of Lebanon is necessarily a synthesis of its specific condition and the fixed formulas of the concepts of life, art and design prevailing in the whole region.

As regards thermal insulation, the massive construction in mudbrick or stone automatically satisfies the exigencies of the climate. The absorption capacity of walls and ceilings is such that the daily temperature rise within the house is delayed sufficiently to mitigate the change of temperature between night and day. On the coast daily temperature variations are small (F2) but humidity is high during the summer months. Under such conditions cross-ventilation is essential and the Lebanese house types, particularly the central hall scheme, provide sufficiently for it.

Cross-ventilation is also facilitated by internal windows or vents between the rooms and the central space, which originally was permanently open. Furthermore, the very position

of the central living space, be it the liwan or the central hall, ensures that it is the coolest space during the hot daytime. Shielded on its long sides by the adjacent rooms, it can be reached by the sun on its narrow sides only. Sensibly, the open end of the hall is either turned to the north or to the south in order to avoid deep penetration of the sun's rays.

Today Raymond Ayoub, a specialist in environmental control, claims that airconditioning and central heating are superfluous along the Mediterranean coast, provided that buildings are designed in response to climate conditions. It is interesting to note that his suggestions and prescriptions to attain adequate environmental control are virtually all realized in traditional Lebanese houses.[58]

Looking at the different climatic zones of the country (see chapter I 3) we find that zones A and B, that is to say the western slopes of the Lebanon, ranging from 0 to 1200 m. (or the coast to the limit of habitation) reveal the same variety of house types throughout. In order to demonstrate this fact the Chouf region was systematically surveyed (F281). In each of the villages with altitudes ranging from zero to one thousand meters we found a similar mixture of houses. Only Ain Ouzain, the highest and poorest community, has mostly closed rectangular houses, while Deir el-Kamar, the former capital, is distinguished by its stately court-houses. The orientation of the houses is generally dictated by the topography.

Fortunately, the placement of the house parallel to the contours of the slope and open towards the valley, in most cases also made it face the prevailing wind-direction and ensured the desired ventilation.

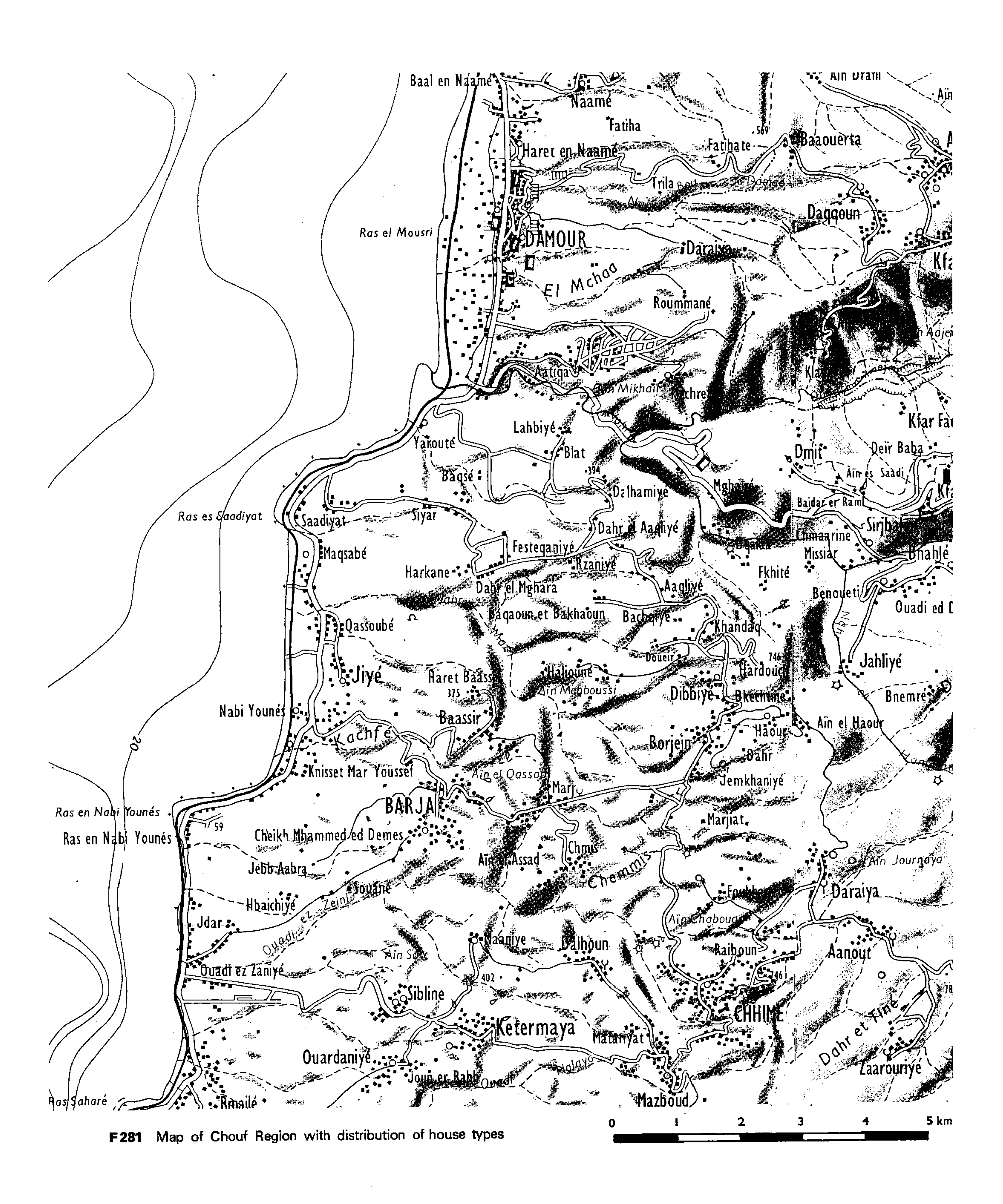
Within the house we find that an effort was made to have foul smelling areas, such as kitchens and bathrooms, on the leeward side of the living areas.

From the bioclimatic diagram (F4) we see that evaporation of water in the air in order to get a cooling effect is useful only at a relative humidity well below 50 %. The charts F2 show that this is the case only in Rayak during July and August. Consequently, elaborate cooling devices in the form of indoor fountains and cascades are not employed. They are only found in upper-class buildings where they exist primarily for their decorative or acoustical effect.

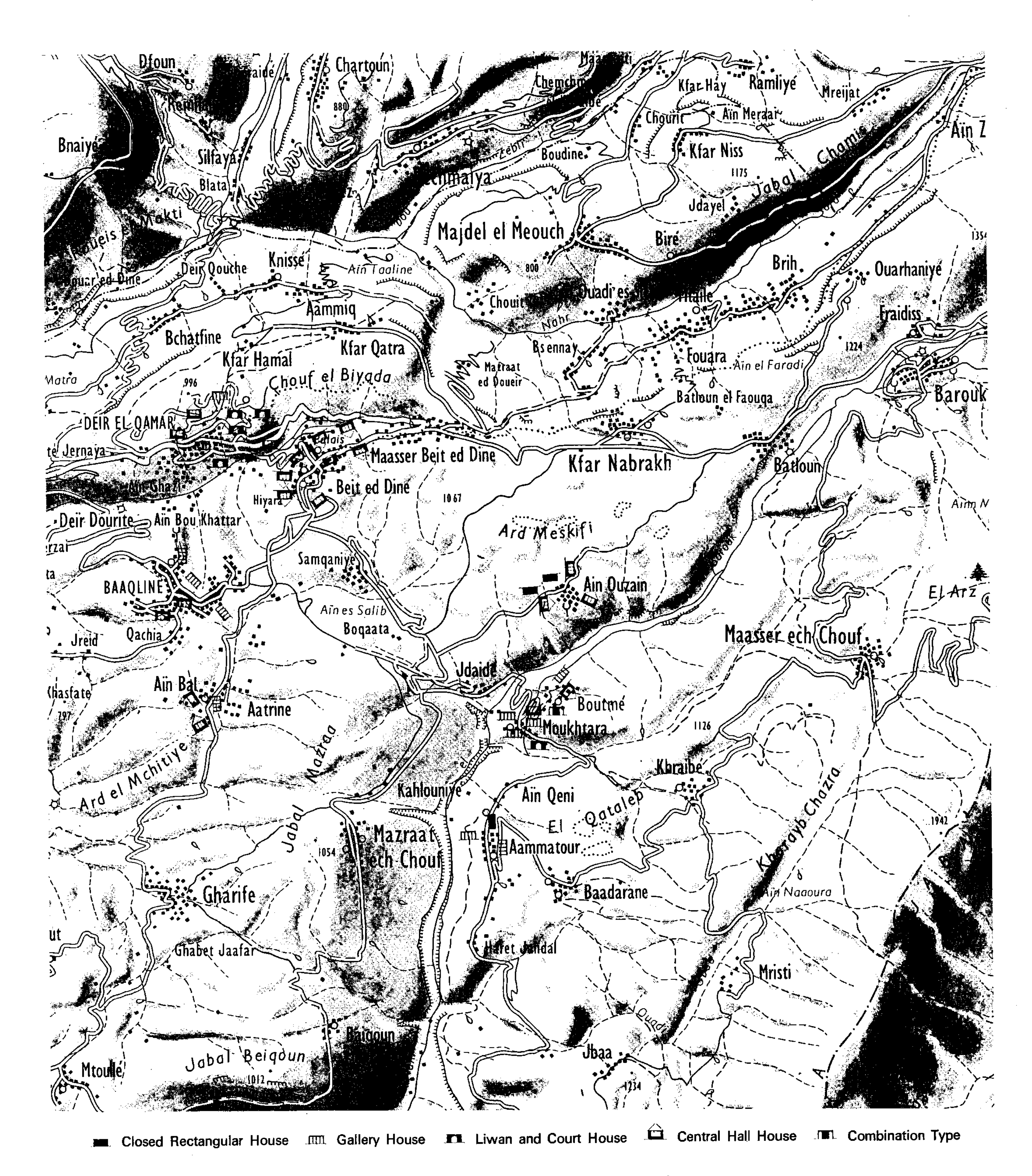
In conclusion we can say that Lebanese architecture displays a remarkable understanding of climatic factors which leads to sound solutions in house construction.

D. History

It is not surprising that very little is left of houses built before the consolidation of the country during the eighteenth century (the historical reasons were given in chapter I 4). The ten centuries from the seventh to the seventeenth are a



F281 Map of Chouf Region with distribution of house types



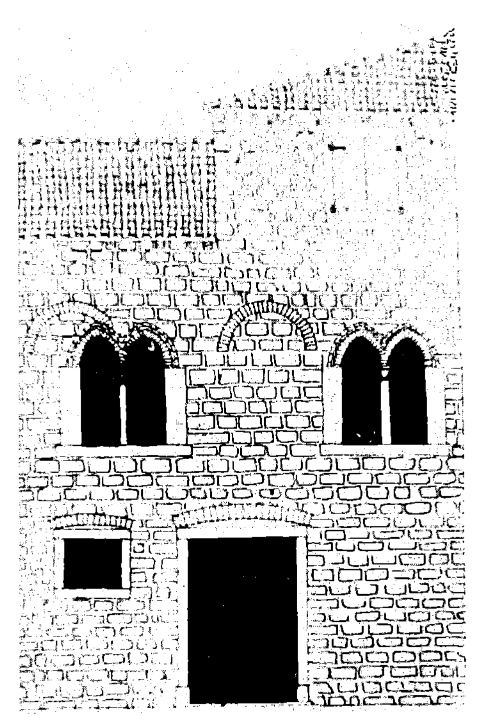
The position of the house indicates its orientation

succession of political and religious upheavals. For Lebanon, the century of Frankish domination and the strong trading connections with Italy and France were of particular importance. These contacts saved the Christian minorities of Lebanon from isolation, and it is possible that they were eager to accept artistic impulses from the west in order to manifest their relatedness.

The building activity of the Crusaders was extensive. The cathedral of Tartus, begun in 1102, incorporates pointed arches, while St. John in Beirut, built in 1110, is Romanesque in style. In 1115 the church in Byblos, and in 1157 Belmont monastery were constructed. However, the greatest buildings of the Crusaders were their huge fortresses, which were designed to protect the coastland. Continuing the Byzantine fortification technique, the Crusaders added pointed vaults and Gothic details. Those imposing castles, usually built high up in the mountains, must have been important places of work and instruction for the local craftsmen, and the high quality of masonry construction, particularly the adherence to and perfect execution of pointed groin vaults, may stem from this period.

The affinity of Lebanese architecture with Venetian architecture of the Middle Ages is very obvious. Venetian houses (not palaces) of the thirteenth to fifteenth centuries are well preserved in Istria. As in Lebanon, carefully executed stonemasonry construction predominates. The similarity of details is particularly striking. The facades are generally built of yellowish to grayish sandstone; the ashlars are usually 25-30 cm. long, 12-15 cm. high and well smoothed with thin joints (F286, F290). However, there are also buildings with rougher masonry (F282, F283, F284) and sometimes brick is used in the upper floor (F283, F287). Doors have rectangular stone frames and relieving arches, which are either segmental (F282, F284, F285, F286, F287) or pointed (F283). The frequency of coupled windows (F282, F283, F284, F286, F287, F289) and the grouping of three windows (F285, F288, F289, F290, F291, F292) are extremely significant. During the fifteenth century the trefoil arch with an ogee ending prevails. The window-sill sometimes projects, sometimes it even rests upon corbels and is used as a shelf for flower pots (F284, F286). The triple windows are carried down close to the floor (F290) and sometimes they have railings or small balconies attached (F289, F292, F293). The framing of some windows or groups of windows by decorative friezes and the application of round medallions between arches is also of interest (F290, F294). The corner loggia shown in F291, for instance, is very similar to the detail in E41).

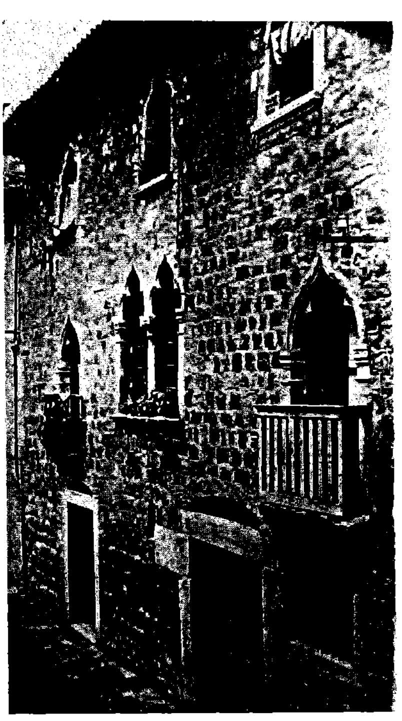
The main differences between these and Lebanese houses are the much more prominent roof eaves, which generally



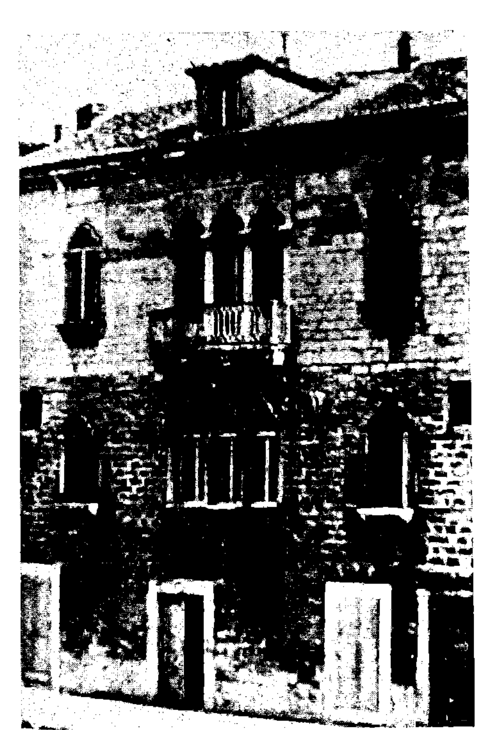
F282 House Carpaccio, Capodistria, 14th c.



F283 Theatro Vecchio, Capodistria, (demolished)



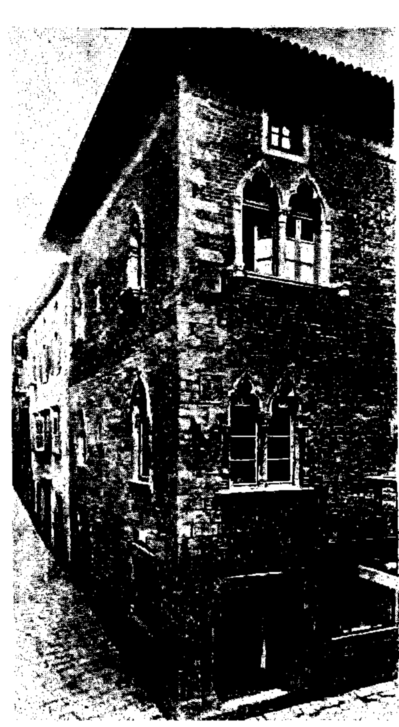
F284 House Robba-Coreali, Muggia, 15th c.



F285 House de Martini, Pola, 14th c.



F286 House Salomon, Gallignana, 15th c.



F287 House Zuccato, Parenzo, 15th c.



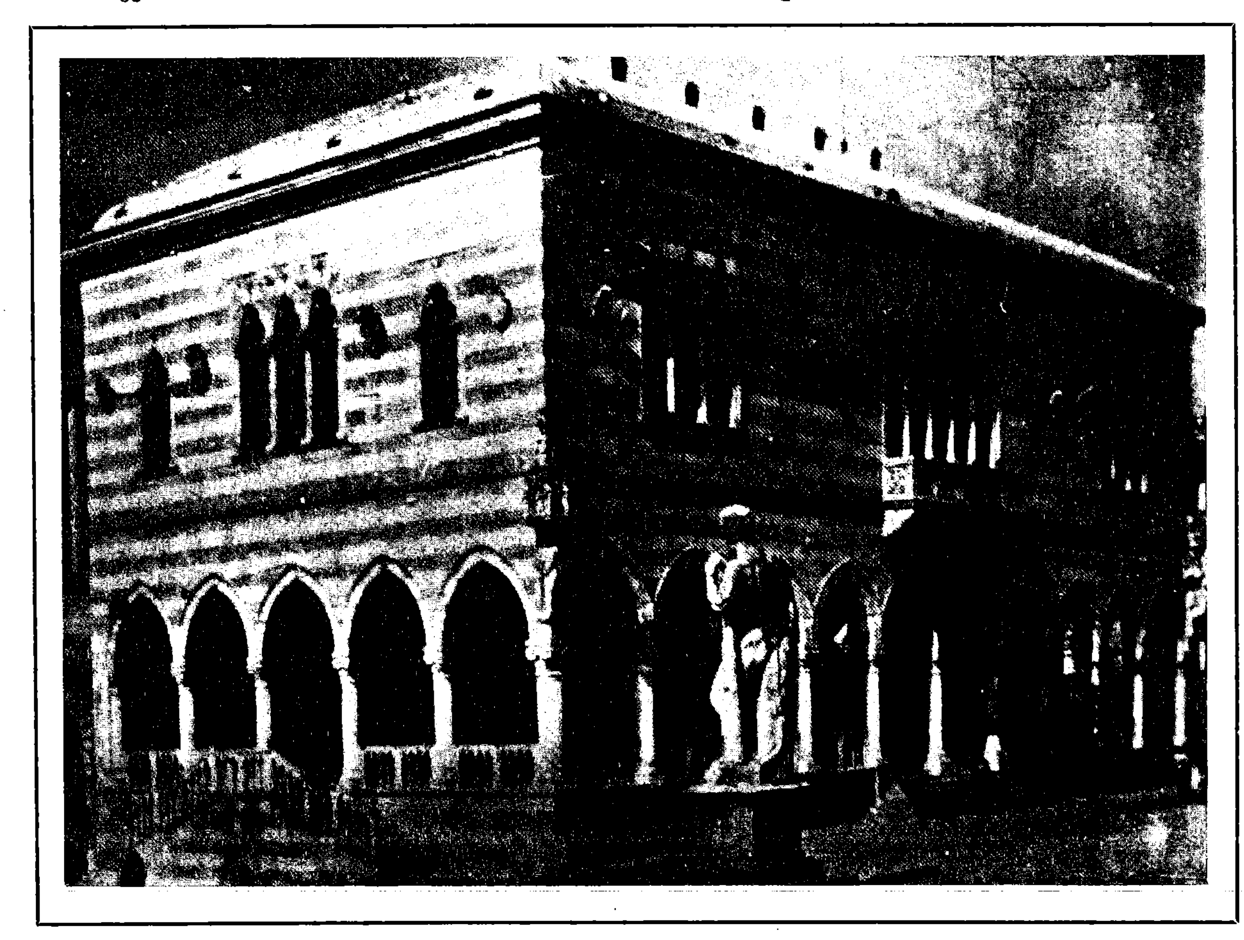
F289 House Corner, Capodistria

F288 Loggia di Lionello, Udine, 15th c.

project sharply and are supported by modillions, and the setting of the houses along city streets with only one or two facades showing. Also, the similarities are more pronounced in the less lavish houses of Istria, while in Venice itself the palazzi receive much more elaborate treatment, triple arches being rare and galleries of five or more arches predominating (F294).

Still, the similarities in detail, in plan (see chapter II 4 D) and spirit exist. In order to assess correctly this relatedness we have to take into account that Venice itself received strong impulses from Arabic architecture, and that, for instance, the arch forms under discussion come from the east.

By geographic location and commercial inclination Venice was more closely related to Byzantium and the Near East than to the rest of Europe, and we can trace with Ruskin how the pointed arch was reluctantly grafted on to the semicircular arch, bringing about the ogee and trefoil arch, both being most characteristic of Gothic Venice. At the same time there are instances of horseshoe arches[59] (F295), which, together with the pointed arch, the ogee and the multifoil arch are all of eastern heritage.

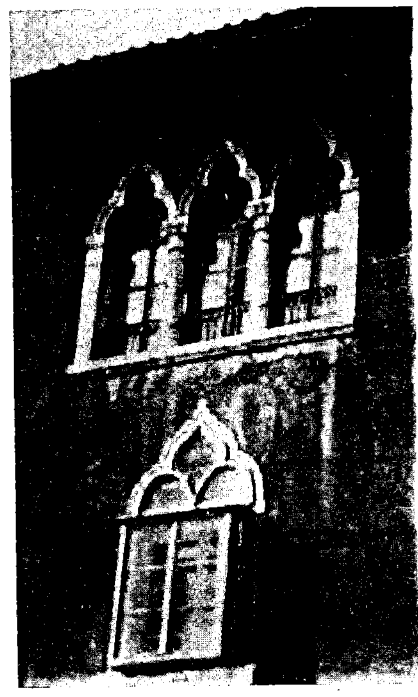




F290 House on Piazza Tartini, Pirano, 15th c.

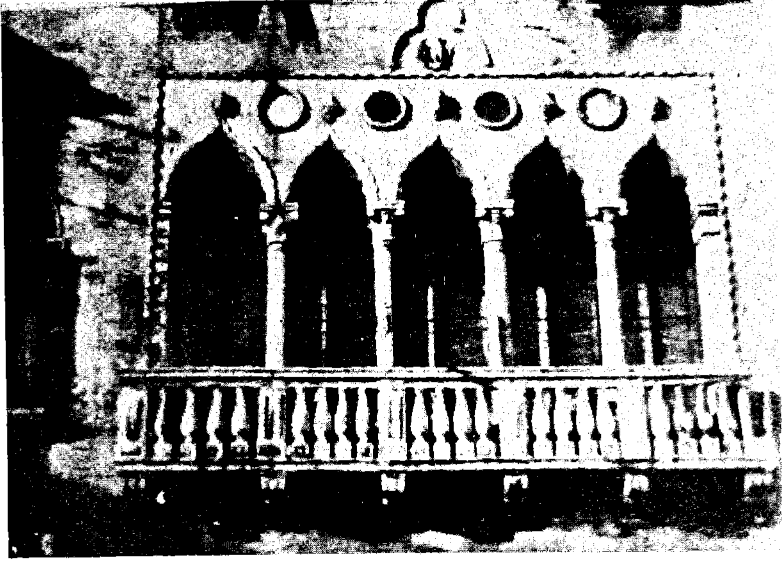


F291 House Parisi-Gonan, Parenzo, 15th c.



F292 House Catecumini, Capodistria





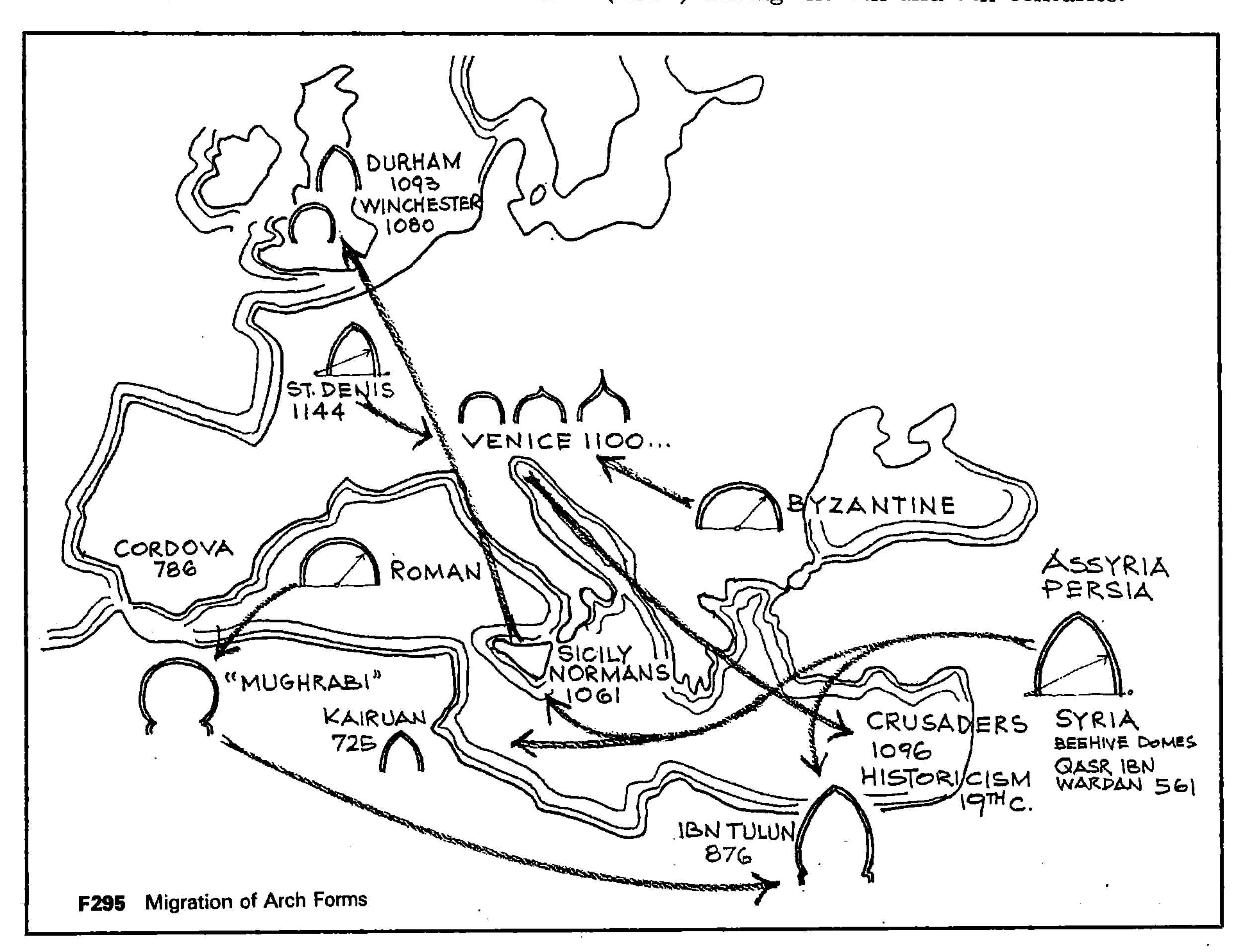
F294 Venice

F293 House Calegaria, Capodistria

It may be useful here to discuss the origin of these arch forms in greater detail. In Sassanian architecture the pointed arch was still unknown,[60] (Ctesiphon has elliptical arches) but H.C. Butler recorded pre-Islamic pointed arches at Qasr Ibn Wardan (northeast of Homs) built around 561 A.D.[61] Creswell follows the evolution of the pointed arch in Syria, observing the gradual separation of the arc-centers from one-seventh to one-fifth of the span.[62]

Regarding the round horseshoe arch, Cresswell places the first examples in the Seleucid era of the fourth century, also in North Syria, but he states that the true home of the round horseshoe arch in Muslim times is Spain and North Africa.[63] It is not surprising then, that the combination of pointed and horseshoe arch should occur at the meeting of Eastern and Western Islamic architecture, in Egypt.

Rivoira states that the pointed horseshoe arch was first used in the mosque of Ibn Tulun (872) in Cairo, and it is remarkable that it establishes already the 3:4 proportion of the Lebanese arch.[64] As to the ogee and multifoil arches he gives examples of them in the cave temples of Ajanta and in Gandhara (India) during the 6th and 7th centuries.[65]



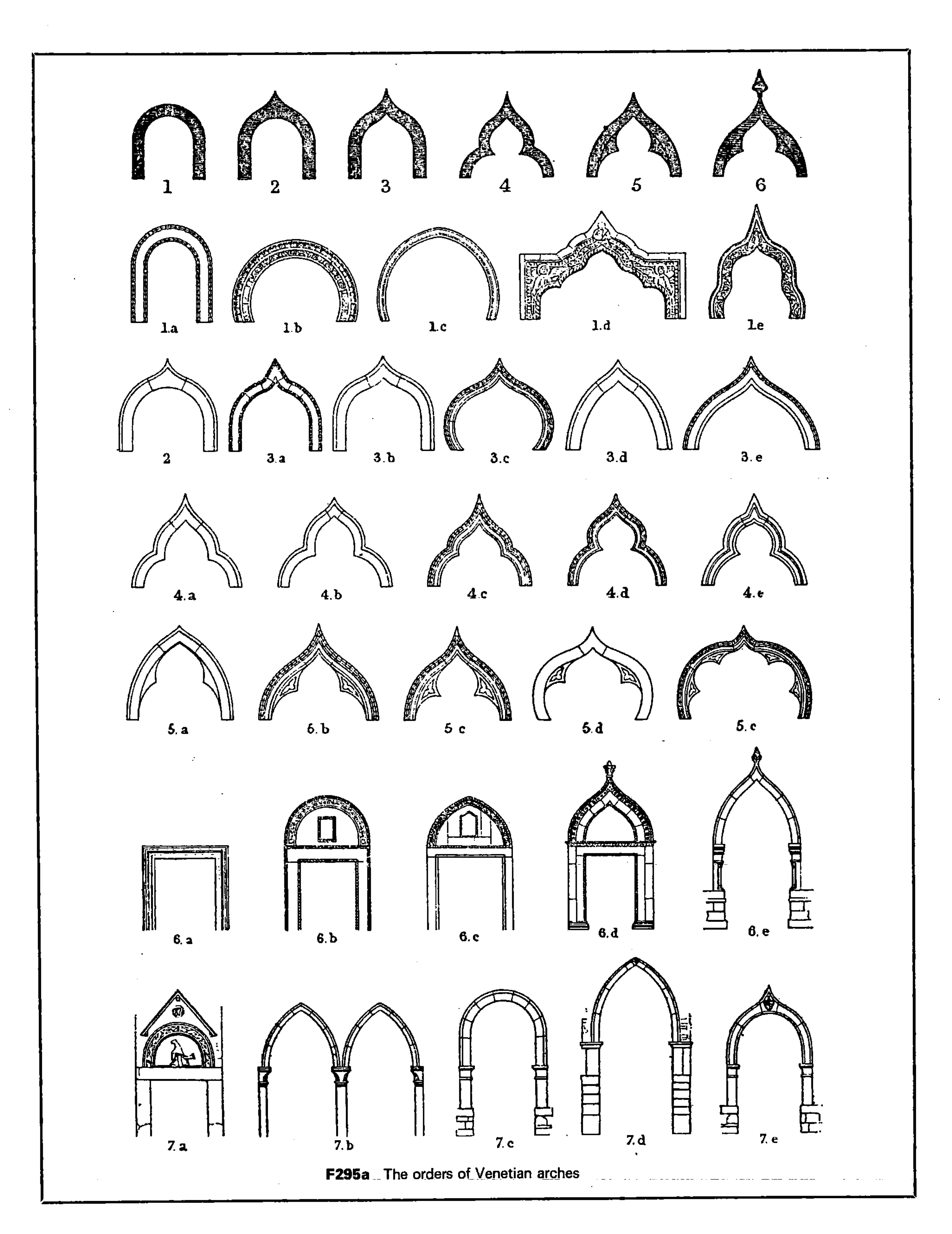
F295 Migration of Arch Forms

The pointed arch was brought to north-western Europe by the Normans from Sicily, which they conquered between 1061 and 1092, and by the Crusaders, who encountered it in Syria in 1096. In Europe it became the hallmark of Gothic architecture, and it reached Venice in its developed form with foils from the west during the fourteenth century, well after it was tentatively grafted on the circular arch and decoratively modified from the twelfth century onward. A very detailed account of this development is given by Arslan, who by and large sustains Ruskin's six orders of Venetian arches,[66] and accepts their oriental origin (F295, F295a).[67]

Apart from arch forms, which most readily strike the eye, many other characteristics of Venetian architecture are typically Eastern and therefore close to Arabic designs. The handling of facades as one continuous surface; the free distribution of openings and astructural superposition or arcades; the shifting of axes; the tendency to increased openness in the upper floor; and the finishing of walls in geometric patterns divorced from the tectonic contents of the building, are all oriental traits.

Therefore, noting that the exceptional position which Venetian architecture holds in Europe is due to impulses from the East, we may justifiably conclude that the similarities between Lebanese and Venetian architecture are not indicative of direct Venetian influence but rather due to a common spirit of two traditions which are subject to similar influences and conditions such as security, attractive surroundings, the need for ventilation and a developed stone masonry technique. Hence the opening of buildings to the outside and the dominance of arches in the facades.

In contrast to the important exchanges with Venice, the relations with other parts of Italy did not much influence the architectural evolution of Lebanon. In this respect the effect of Fakhreddin II's exile at the Court of Tuscany from 1613 to 1618 is much overrated. He may very well have developed a liking for Italian art and architecture—wholly Renaissance at that time and entering into the Baroque stage. But according to Carali[68] the experts whom the Duke of Tuscany eventually placed at his service did not arrive before September 1631 and stayed only for a year and a half in Lebanon. Of the four specialists listed only two were builders. Still, one may assume that after the return of Fakhreddine II in 1618 Italians started to work for him, but it is most likely their efforts would have been spent on superficial embellishments. We know from Magri[69] that in 1622 Fakhreddin built a "most magnificent palace at Beirut in the Italian manner" but a hundred and forty years later Mariti[70] describes it as a work of the Saracen chiefs of the twelfth and thirteenth centuries and he considers the work of the Tuscan masters only as a modernization of the palace according to European taste.



F295a The orders of Venetian arches

In fact it is to the credit of the deep roots of Lebanese architecture that the strong relations of the country to central Italy during the seventeenth and eighteenth centuries were not reflected in the acceptance of Renaissance forms such as the semicircular arch or the classical orders. In spite of these contacts and the ever present remnants of classical Roman architecture, Lebanese architecture retained its non-classical medieval character by continuing the use of pointed or multifoil arches, by the insistence on plain cylindrical column shafts of very slender proportions and a rejection of classical ornament.

From the middle of the nineteenth century onward we actually see slow growth of Gothic elements in the details. The capitals with foliage decoration, the pointed or double curved forms of divisions in the lights of the triple arcade, and the appearance of mouldings are indicative of this tendency. It is quite possible that this trend was the result of European historicism, of Ruskin's rediscovery of Gothic architecture and particularly Venetian Gothic in *The Stones of Venice* (1851 and 1853), and the publication between 1854 and 1861 of Viollet-le-Duc's *Dictionnaire raisonné de l'architecture française du 11e au 16e siècle.*

E. Socio-Economics

Looking at the distribution of housetypes in Lebanon one is surprised that the composition of the country of a predominantly Christian northern part and a predominantly Druze and Muslim southern part is not expressed in the architecture. The religious affiliation of a family cannot easily be deduced from its habitation. An explanation may be that the conditions of life in the mountains were essentially the same for all religious communities. The theoretically different standing of Moslem women did not manifest itself very much because Christians and Druzes also adhered to a strongly paternalistic family structure.

Furthermore, coexistence of religions was and is the keystone of Lebanese politics since the late sixteenth century. Already Fakhreddin II (1590-1635) based his rule upon the principles of security, prosperity and religious equality. Emir Beshir II (1788-1840) a Christian, married a Muslim, and built in his palace at Beit Eddine both a chapel and a mosque.[71]

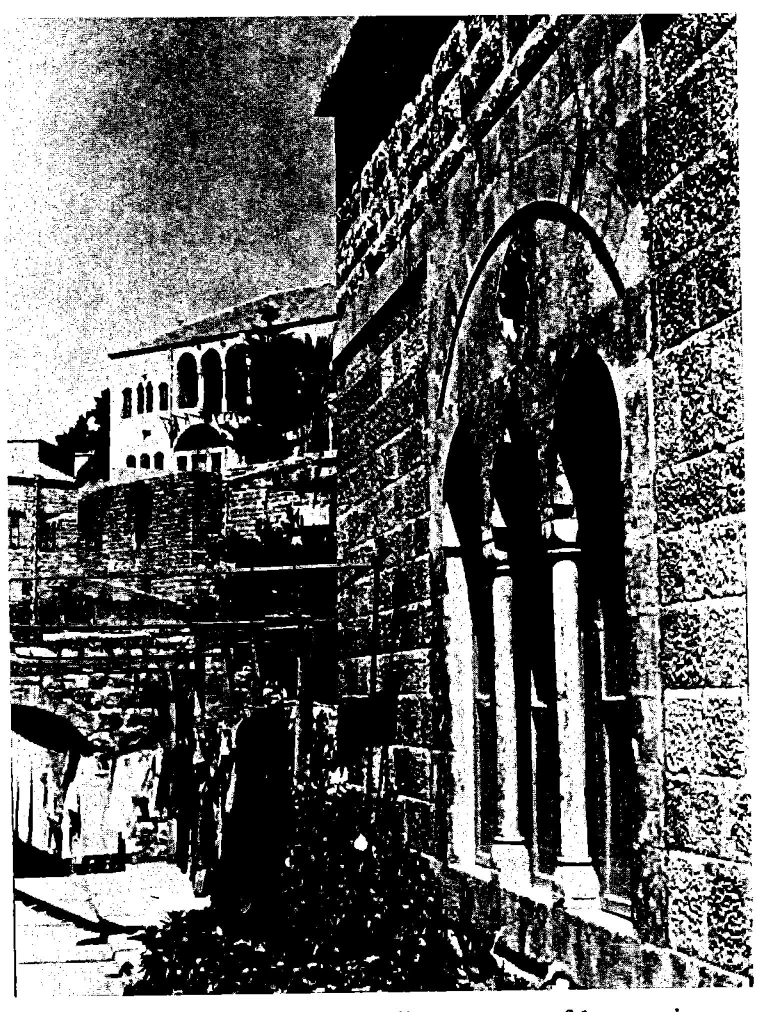
In addition, favorable economic conditions existed in Lebanon which originated in the liberal social constitution of the country and its autonomous status within the Ottoman Empire, eliminating excessively harsh taxation (see chapter I 5). While in neighbouring Syria and Palestine the farmers' houses remain very modest, in Lebanon, not only the individual dwelling house attains artistic qualities, but whole villages are distinguished by their uniformly high level of design.

Owing to sustained European support, particularly in education, the Christian population during the nineteenth century obtained a leading position in the country. In time this also meant economic superiority, and today Christian communities in general are financially better off than Muslim communities.

The influence of Islamic philosophy is strong in the artistic and architectural forms and details. Islamic art derives much inspiration from contemplating the unity of God. Harmony obtained by balanced and interwoven geometric abstraction is the aim of artistic endeavor. Artists work in anonymous succession, and the constant pendulum swing from static to dynamic styles and back again are foreign to Islamic art. This accounts for the similarity of the work of several generations, which is sometimes misinterpreted as stagnation by western observers.

On the other hand there is very little Islamic influence in the planning of houses. Franz Pascha describes the differentiated planning of the house in Cairo, with staggered corridor to the courtyard, disposition of the *salamlik* (men's and guests' quarters) on the ground floor, of the *ḥarīm* on the upper floor and screening of the harem's windows by *msharrabiyyeh* screens.[72] Similarly, Reuther relates the recurring characteristics of the Iraqi house: Large internal court, indirect access, seclusion from the outside.[73]

In comparison the Lebanese houses are simple and straightforward. However, this simplicity entails the lack of specialized spaces in the house, either for cooking or washing, and a lack of privacy for the individual. These factors are the biggest hindrance in adapting old houses to modern requirements.



2. THE QUALITIES OF RESIDENTIAL ARCHITECTURE

A. Scale, Massing and Space

Massing of single houses as well as groups of houses is very satisfactory, and creates full harmony between house and landscape, house and house or village and landscape. The basis of this harmony is the prismatic simplicity of the design and the adherence to a uniform scale.

In town we witness the intricate juxtaposition of houses, which creates a repetitive rhythm of mass and void which covers the land without destroying its relief. Under crowded conditions the individual house usually follows the limits of the piece of land, and surrounds the open space which is retained as one whole on the inside. This gives a useful and protected court and avoids the creation of leftover strips around the building. On level ground this would result in atrium houses, but the predominantly hilly condition of Lebanon in most cases brings about an opening of the court on the valley side. We have then on a large scale a space composition similar to the central hall scheme, where closed spaces contrast with open spaces and shelteredness is combined with an unimpeded view.

The red tile roofs which came into use during the nineteenth century do not disturb the prismatic clarity of the houses, since complicated roofshapes and pronounced eaves are avoided. These roof tiles are generally imported from

Marseilles and are mounted in a uniform slope of about 35°.

It is remarkable how well the human scale is maintained in Lebanese architecture. This applies to principal masses as much as to the handling of the smallest detail. Standard size masonrywork automatically introduces a clear overall definition of scale, but every gate or window and each arch is dimensioned in reasonable relation to need and importance. The fabric of a town is rarely disturbed by a predominant building. Even important buildings such as places of workship, serails or palaces are not designed as overpowering manifestations but rather as distinguished firsts among equals. Mosques and churches in traditional design merge with the surrounding community, and can be picked out only by their minaret or belfry.

Modesty and restraint are therefore the key qualities of traditional Lebanese architecture, and these mirror a social structure in which individual or corporate wealth is not displayed to the outside world. The rooms at their usual height of four or more meters generally have lofty proportions, but they retain a human scale, provided that the furniture emphasizes the lower portion of the walls and the floor, as was originally the case.

Passing through the successive spaces of a house or the town at large we are subjected to an everchanging play of contrast: narrow-wide, light-dark, low-high, open and closed.

B. Proportion, Rhythm and Form

Growing out of the discipline of constructing in stone, the shapes of walls and roofs normally adhere to the simple geometry of squares, rectangles and trapezoids. Spans and cantilevers are strictly limited. While the repetition of similarly shaped openings preserves continuity, their irregular distribution within one facade sometimes creates welcome diversity. Still, symmetrical compositions abound, particularly in connection with the triple-arch motif. However, such symmetry is never artificially applied from the outside, but is in harmony with the internal arrangement of spaces, which in turn follows a module of construction dictated by the length of timbers or the span of vaults. Strong rhythmic effects are created by the grouping of windows and arcades. The uniform adherence to an upright proportion of openings and the attendant limitation of their span is extremely important. Imposed by structural necessity, it ensures the correct expression of stone masonry.

Considering the tectonic composition of multi-floor construction, the usual practice of building non-vaulted floors on top of vaulted ones, and the general tendency to have fewer openings on the ground floor than on the upper floor, produces an appropriate decrease of massiveness which satisfies our inherent sense of stability.

C. Color and Texture

Color and texture contribute to the homogeneous and organic character of Lebanese architecture. Stone is the preferred material for exterior walls, and the finishing of the stone reveals an intimate knowledge of the material, acquired by generations of stone-masons. These finishes range from rock-faced, with or without tooled margin, to pointed, crandalled or bush-hammered finish. The types of masonry vary with the importance of the work, from polygonal dry rubble masonry to meticulously cut ashlar work.

However, within one building the basic type of masonry will not change, neither in scale nor in ranging, the only differentiation being in surface finish and jointing. Random or broken range masonry is not used, even rubble masonry being ranged, often in a herring-bone pattern.

Pointing of masonry joints is done with great discretion. The joints are never elevated to undue importance; they are usually hairjoints or only a few millimeters wide.

The colors follow the limited palette of nature, ranging from yellowish sandstone with hues of red and brown to all possible shades of gray limestone and near-black basalt. Whitewash is sometimes used on the mud-brick and rubble-masonry of the *Beqa'a*. In some communities bleached earth roofs are predominant, while in other villages the vividly red tiled roofs contrast with the green of gardens and hills.

The calculated use of color for decorative effect is limited to a few instances, at entrances, windows or arches, where differently colored stones are combined into various playful patterns. Lebanese architecture is more restrained in this respect than Arab architecture in general, where structural clarity is sometimes masked by the decorations.

Tiled roofs, stone walls, wooden shutters and wrought iron share the distinction of aging beautifully if properly used and cared for. The weathering process diminishes the difference between old and new work and in time increases the harmony of the whole.



3. CONCLUSION

THE ANONYMOUS DWELLING is the unconscious expression of a people's culture. Much more than the architecture of the secular or religious powers, the houses of a people mirror the needs, desires and living habits of a time, because they are the direct result of the interaction between man and his environment.

Among the examples presented in this book we find the products of a simple and frugal society, which created its habitat with elementary means but utmost insight into the functional requirements and the potential of the materials available. Houses like E3 are the pure manifestation of intuitive group creativity. The nineteenth century witnesses the beautiful blossoming of craftsmanship, which is the fruit of the country's stability attained under Emir Bechir II. The artistic quality of this period was not dependent upon imported models, and the architectural monuments of this time prove the stylistic self-sufficiency of the country which expressed itself in the manifold variations of a convincing, locally rooted tradition.

At its best the Lebanese house attains an excellence which derives from the deepest source of artistic creation, the mastery of a craft. We see the evolution of house types which are found in all parts of the country. The construction

of a house was the task of the master mason of the village, who agreed with the client on one of the common types of plan, without any formal documents. The house was built by simply following tradition, usually with the participation of the whole family. This process rendered deviations from the acknowledged standards of correct and proper building impossible. Also, people were unaware of new possibilities for development; they accepted what they had, and did not strive for anything else. If monotony was avoided it was due to the variety of the landscape and the imaginative handling of decoration by the artisans who were not subject to a strict canon of forms. The manifold shapes of capitals, the intricacy of sparingly distributed embellishments, and the subtle distinction in surface finish are a continual delight.

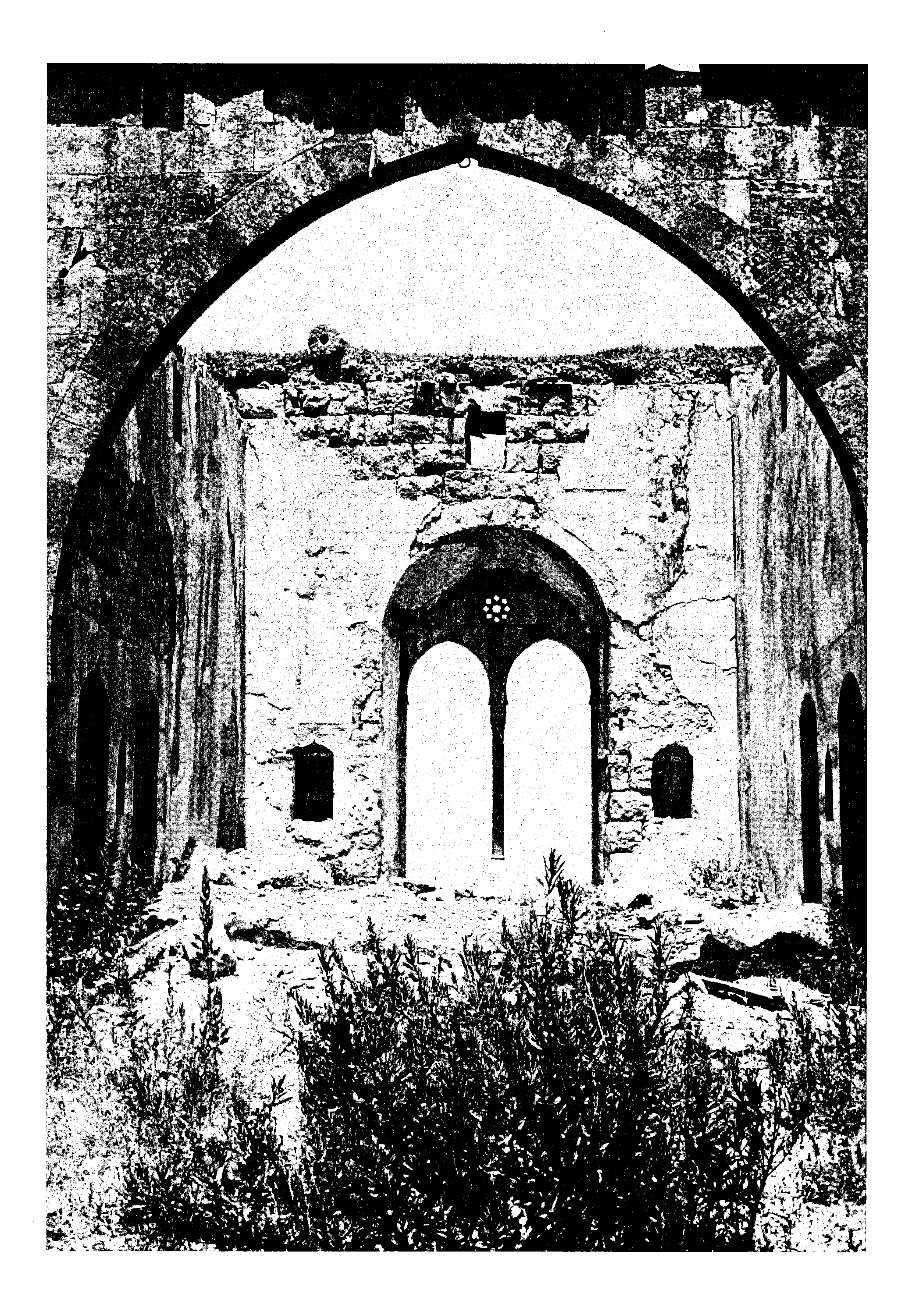
The Lebanese house occupies its place naturally and without pretension, it is imbedded in a landscape humanised by countless terraces, and built of the materials furnished by its environment. Probably its finest manifestation is the detached, isolated residence, rising high above the surrounding land, the expression of a degree of independence and security not known in adjoining lands.

But also in the villages and towns on the slopes of the Lebanese mountains the balance of massing and the harmony of forms were exemplary. The arrangement of the houses reflects deep understanding of the environment, and is indicative of a remarkable social balance.

Gropius gives us a clue to the factors contributing to the quality of these settlements when he writes:

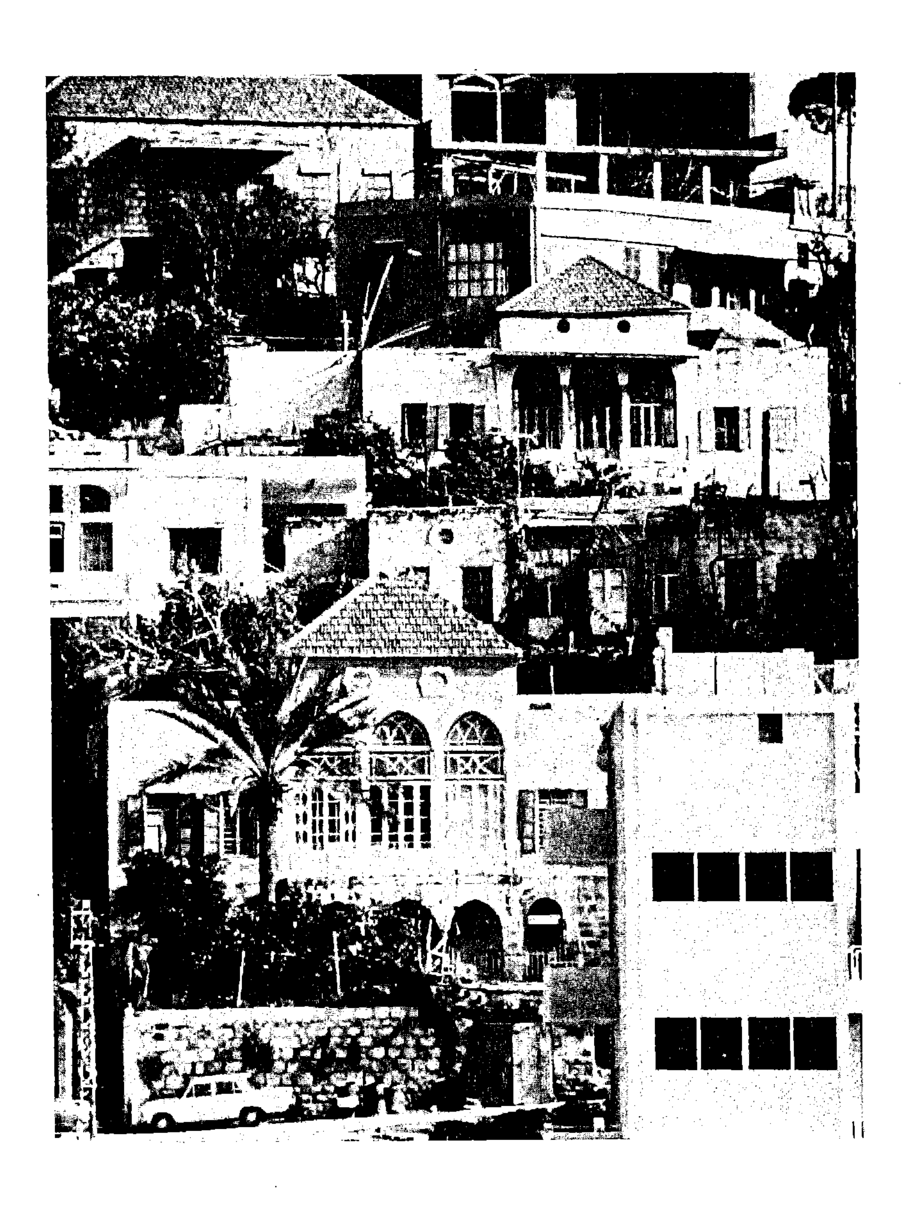
> "The most admired cities of the past are conclusive proof that the reiteration of 'typical' (i.e. typified) buildings notably enhances civic dignity and coherence. As a maturer and more final model than any of the prototypes merged in it, an accepted standard is always a formal common denominator of a whole period. (...). Proper respect for tradition will find a truer echo in these than in the miscellaneous solutions of an often arbitrary and aloof individualism, because the greater communal utility of the former embodies a deeper architectural significance."[74]

In this study the architectural evidence concerning the houses of Lebanon was given pre-eminence, but we know that the whole spectrum of human life has to be considered if we want to do full justice to domestic architecture. Indeed Amos Rapoport maintains that the spiritual qualities of a people, such as culture, ethos, *weltbild* and national character are decisive in influencing the shape of its habitat, while environmental factors have only a modifying power.[75] The aim of this study then is not only to contribute to the appreciation of Lebanese architecture, but to spark further investigations into the cultural substance of a people.



V

EPILOGUE



1. THE DEVELOPMENT OF RESIDENTIAL ARCHITECTURE FROM 1900 TO 1970

THE PERIOD UNDER DISCUSSION may be divided into three phases:

PHASE I: From the turn of the century until the end of World War I and the collapse of the Ottoman Empire (1900-1918).

PHASE II: The time between the two wars until the end of the French Mandate (1918-1944) and

PHASE III: The period since independence (1944-1970).

The following brief review is based upon a survey conducted during the summer of 1971 in Ashrafieh, a residential district of Beirut which contains many examples of the three phases.

A. The First Phase (1900-1918)

At the turn of the century hilly Ashrafieh had the character of a garden city. Houses were placed in the middle of spacious lots, narrow lanes which barely allowed the movement of carriages led to individual homes.

We have already seen examples of houses in Ashrafieh: the Trad House (F157), the Khouri House (F158) and the Amm House (E67). All three of them are central hall schemes, typical of the 1900 era and an appropriate point of departure for our review.

The most important observation is the persistence of the central hall concept. Only gradually was this simple arrangement of rooms augmented by subdivisions which were introduced to offer more convenience, more privacy and areas of a more specialized character.

During Phase I we may notice three steps in this direction:

1. Incorporation of the stairway inside the building.
2. Subdivision of the central hall into a general living area (*dār*), a salon or reception area (*mrabba'*) and a dining space (*mā'ide*).
3. Grouping of kitchen (*maṭbakh*) and bathroom/toilet (*hammām/bayt el-mayy*) in a corner with a small corridor (*dahlīz*) as buffer zone.

The apartment's entrance still leads directly into the living room and the living room continues to be the central circulation space, giving access to all other rooms.

The salon area was sometimes referred to as the "Liwan", following the Turkish practice of arranging special sitting spaces next to a common circulation space (compare F176, F177).

The most important technical innovation was the introduction of piped water, bringing about the definitive installation of kitchen and bathroom, usually next to each other and equipped with a warm-water tank between them. The tank was heated from the kitchen side and supplied hot water to the bathroom.

Toilets were not necessarily incorporated in this scheme but remained as out-houses in the garden. A typical plan of this period is shown in F296.

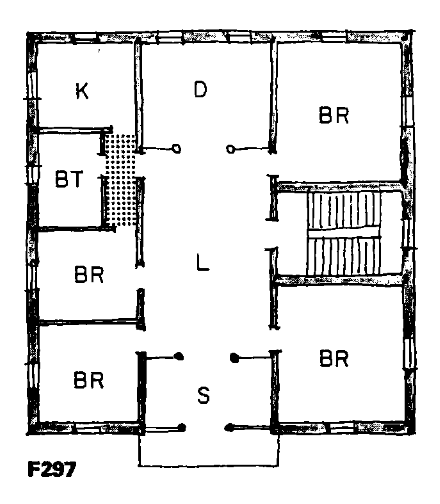
During the same time the number of floors was increased, first to three then to four floors (including ground floor). This was the limit until concrete frame construction and lifts were introduced during Phase III. Similarly, basements were not adopted until after the appearance in Lebanon of efficient excavation machinery. During Phase I cross vaults were used over the ground floor to provide openness for services or commercial purposes. Intermediate floors had girders of steel-I-sections, secondary beams of timber, then boarding and a layer of decomposed sandstone (*naḥt*, pl. *nḥēt*) with marble or terrazzo tiles. Second-rate sandstone

F296

was frequently used in construction, necessitating the plastering of exterior walls and offering the opportunity to apply stylish but cheap decoration.

B. The Second Phase (1918-1944)

During the first half of Phase II (1918-1930) there is a further articulation of plans. Living and sleeping areas remains as before, but the service area is expanded. Kitchens are augmented by pantries as a buffer zone between kitchen and dining room, maids' quarters and laundry facilities are added. Lavatories are now included in or added next to the bathroom, but both of them usually remain part of the service area, which as a whole is considered an unpleasant affair, to be separated as much as possible from the rest of the house. Often, therefore, the service area projects out from the main body of the house.

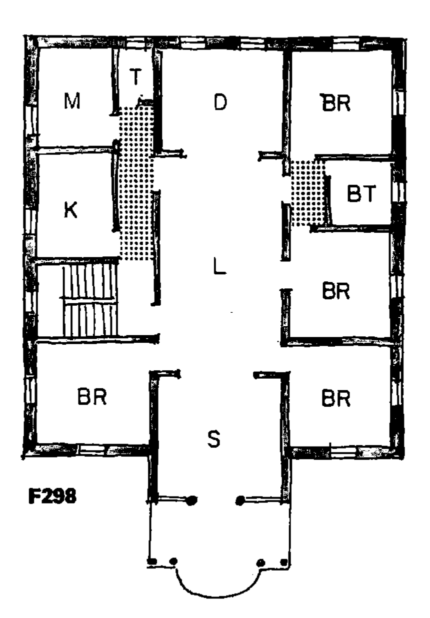


F297

The *dār* is still the center of the house, a portion of it being set aside as the salon. The dining room is frequently placed on the side of the living area, towards the kitchen. A typical plan of this stage is shown in F297.

As far as construction is concerned, wood was progressively eliminated by the combination of steel beams and segmental brick vaults plus sand and tiling, or steel beams plus concrete slabs.

The second half of Phase II (1930-1944) brings the adoption of bathrooms as part of the sleeping area. This was a revolutionary change, since it meant shedding the aversion against mixing sanitary facilities with living quarters.



F298

Of course, this acceptance was made possible by the improved quality of installations, the existence of a dependable water supply, and a suitable sewage disposal system.

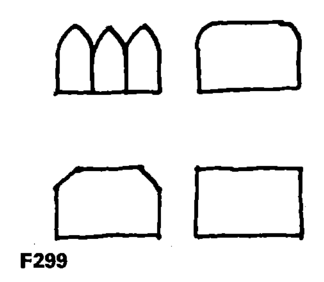
The central hall still remains intact and bedrooms are found on both sides of it but parallel circulation by means of internal corridors offers increased privacy. F298 gives a typical arrangement.

During this period reinforced concrete frames consisting of columns, drop beams and slabs gained full acceptance. Structurally, the bearing wall was eliminated, although massive wall panels remained as infilling. The arcade as a supporting device became obsolete, and was hesitantly replaced by a large rectangular opening (F299). Balconies were enlarged into terraces supported by concrete columns.

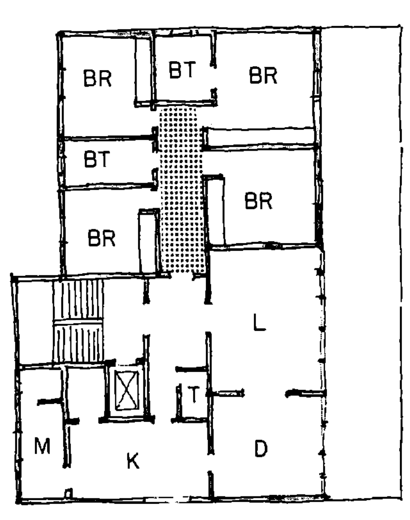
C. The Third Phase (1944-1970)

The slow disintegration of the tightly knit family unit into a group of individuals, the increasing preference for privacy as opposed to togetherness made people finally discard the central hall scheme. This change coincided roughly with the gaining of political independence at the end of World War II

and the economic boom associated with the development of the oil-rich Gulf countries. Beirut became the commercial and professional center of the Middle East and the influx of people to this city created a great demand for apartments. This introduced the construction of apartment houses with several flats per floor. Apartments which occupied the full depth of a block became rare, and the ever increasing density of construction produced a distinction between primary and secondary elevations. Living rooms had to be arranged along the main facade, which alone offered sufficient light and view. Therefore, the sequence of living-dining-salon had to be arranged parallel to the facade, preferably accompanied by a continuous terrace. These were technical reasons for the end of the central hall scheme. If natural illumination was improved, such rooms were generally hotter during the summer and they also lacked cross ventilation, so necessary for comfort. However, the new arrangement finally allowed the full separation of the three main areas of a home: services (kitchen, laundry, storage, maid's quarters), living area (living room, dining room, salon) and sleeping area (bedrooms and baths) (F300).


F299

With regard to the finishing of buildings, the introduction of the full range of industrial building materials imported from all corners of the world suddenly offered a bewildering freedom of choice, which severed the last links with the past.

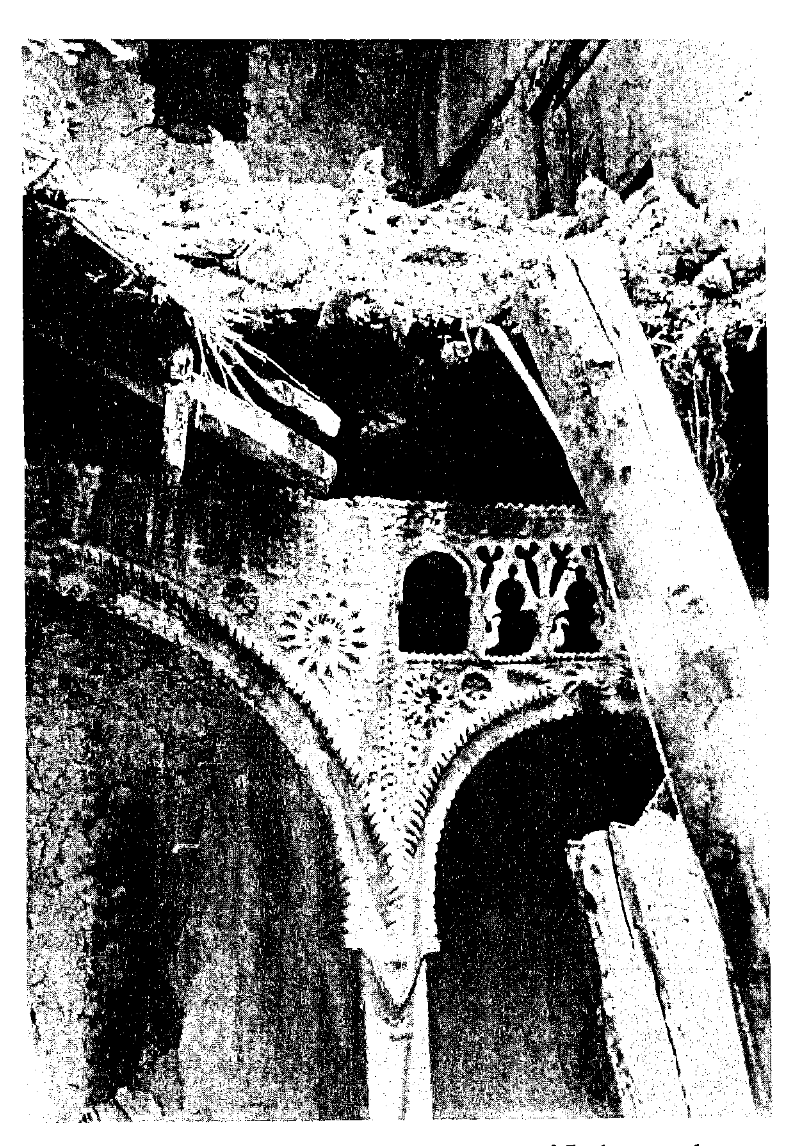


F300

In assessing the general standard of residential construction — today mainly apartments — we can say that it is superior to European standards in space allocation, adequacy of room size, extent of terraces, the number of bathrooms and the incorporation of built-in services such as wardrobes, etc.

This has been made possible through lower construction costs, but above all climatic conditions require more spacious arrangements (the law prescribes ceiling heights of at least 3 m. unless a building is air-conditioned). Also, the country was never subjected to such low post-war standards as Europe.

However, the urban planning quality is far below that of Europe, and while the average city apartment may be superior to European standards, the crowdedness of construction and the absence of green spaces, playgrounds for children and general community facilities offsets to a large extent any such alternative advantages. Also one must add that adequate housing for middle or low income groups is desperately lacking.



2. THE DESTRUCTION OF THE LEBANESE HOUSE

EVERYBODY who is aware of the beauty of Lebanese houses and villages witnesses with great concern the rapid destruction of a valuable heritage. It is a sad fact that today's building activities do not respect the architectural values of the past, but rather follow practices which are diametrically opposed to traditional habits. With the introduction of contemporary building methods and materials the unity of construction and landscape has been lost. The stone-mason's trade is dying out, and with it the skill of working in stone.

Also lacking is the feeling for harmony and proportion; new buildings spring up in every conceivable shape and without any relationship to their surroundings. Noble restraint has been replaced by obtrusive extravagance, intricate gimmicks have supplanted the simple honesty of the stone-mason's work, misunderstood modernity competes with artificial reinterpretations of traditional forms. What are the reasons for these deplorable developments?

First of all, Lebanon was not prepared for the unexpected postwar boom, neither administratively nor professionally. The liberal spirit of the Lebanese, which was responsible for

the spectacular economic growth of the country, also brought about a lack of respect for civic interests. Nobody worried about the effects of a development which everybody embraced enthusiastically, and did not dare to hamper by restrictive measures. Municipalities took pleasure in collecting taxes from real estate development and were kept busy creating the urgently needed infrastructure.

Since there were few local architects, foreign designers with more or less adequate qualifications flocked to Lebanon, with little knowledge of the region and no appreciation of its specific character. There were only two engineering schools, both of recent origin, producing so-called architectural engineers. Even today no official distinction is made between civil engineers and architects as far as the design of buildings and the granting of building permits are concerned. More buildings are designed and built by civil engineers than by architects, and still more without the direct involvement of either.

Another reason for the rapid change lies in the attitude of Lebanese businessmen, who are open to all innovation, and will generally disregard cultural values if commercial advantages are at stake. The economic upswing entailed a rapid urbanization which centered on Beirut and caused a concomitant drain of the village population in the mountains. On the other hand certain mountain communities became fashionable summer resorts and were subjected to sudden unplanned growth, too.

Above all, the construction of a house which at one time was the crowning achievement of one's life, being brought about with the concurrence and cooperation of the whole community, is nowadays more often than not a purely commercial venture, designed to produce a quick profit.

Fortunately, as it becomes more obvious how much damage is done to the environment by poorly planned and misdirected architecture, there is a growing awareness of the importance of maintaining high architectural standards. Hopefully, this awareness will also lead to an increasing appreciation of the qualities of traditional design.



3. THE PRESERVATION OF THE LEBANESE HOUSE

IT IS NO USE lamenting the passing of an era; we cannot overlook the reality of our modern industrialized world. Indeed, it is our duty to face the issues, to analyse the situation and to promote its positive aspects so as to counter its dangers. In architectural design this means that it does not so much depend upon what technique or material is used, but on how it is used. We cannot perpetuate outdated building methods for the sake of the aesthetic value they produce; we can, however, employ the methods of our day with tact and responsibility, always striving to create a better environment for everybody.

When we are faced with the problem of the preservation of a national heritage, the first demand must be to avoid any unnecessary destruction, impairment or mutilation of this heritage. But, taking the common case that the value of a piece of land rises above the value of whatever construction is situated on it, we cannot blame the owner if he wishes to tear down a beautiful old house in order to replace it by a

profitable modern building. If the preservation of an artistically significant house is in the public interest, then the public must bear the cost.

In Lebanon it is the task of the Department of Antiquities to represent the public interest in such matters. Previously this department was part of the Ministry of Education; at the moment it operates under the auspices of the Ministry of Tourism. This organizational shift may signal a dangerous trend: the predominance of touristic or commercial considerations in the handling of cultural substance.

As its name indicates, the Department of Antiquities is concerned with antiquities and, indeed, all works which were produced after 1700 officially fall outside its jurisdiction. However, there is a clause which states that more recent monuments may also be protected if their historical or artistic value merit such action.[76] The first step in safeguarding an object is its written registration by including it in the official inventory of monuments (inscription à l'inventaire). Inscribed objects must not be changed, neither in their substance, nor in their appearance or use, without the consent of the Department. The owner of the object must submit any plans for alteration to the Department of Antiquities for approval. If no agreement is reached, and the proposed alterations are not acceptable to the Department, it has the option to proceed with the classification of the object in question.[77]

The classification of an object is made by decree of the President of the Republic upon recommendation by the Director of Antiquities. It also allows for the control of the surroundings of a monument, and may include whole landscapes. Private owners, whose property rights are severely restricted by the classification, may ask to be indemnified. Such compensation is proposed by a commission of specialists and usually settled by court action.

Finally, the expropriation of the object may be undertaken; then the Department can commence with investigations, restorations, etc.

The yearly budget of the Department of Antiquities is at this moment (1972) approximately LL. 2,5 million for expropriations; LL. 1,5 million for excavations; and L.L. 800.000 for restoration.

The problem in Lebanon is the abundance of historically significant monuments, which makes the allocation of funds exceedingly difficult. However, the truly Lebanese heritage, which dates from the eighteenth century and, from a national point of view, is at least as important as antique treasures, has been relatively neglected. Only palaces and public buildings are classified; dwelling houses remain unprotected. The Department of Antiquities also maintains an annual fund of L.L. 300.000 (1972), which is set aside to cover the additional

costs incurred by private parties when they renovate buildings in a way which preserves their original character.[78] This fund is made available to the extent that the public interest is involved.

Important as the physical preservation of the existing remains may be, still more urgent in Lebanon is the control of new construction and the education of the public to appreciate the values at stake. To further these ends in 1959 a small group of concerned citizens under the leadership of Lady Cochrane founded the Association for the Preservation of Sites and Old Buildings,[79] which established the following as its aims:

a. To support the preservation and restoration of buildings of artistic or historical value.
b. To aid in the development of understanding and appreciation of the artistic heritage of Lebanon.
c. To contribute towards the protection and improvement of natural sites and monuments.
d. To encourage high quality architecture and urban development.
e. To fight ugliness resulting from poor planning or lack of maintenance.
f. To stimulate the interest of the public in all questions relating to the environment.

The Association endeavours to achieve its aims through the organization of exhibitions, the publication of newspaper articles and reviews, and the presentation of films and lectures. In 1966 an illuminating study on the habitat in Lebanon was published[80] which provided much inspiration for the present book. The Association also develops its own inventory of significant Lebanese buildings, advises owners of such buildings how to preserve or to improve them, and advances new projects of merit.

Although the founding members of the Association were influential citizens, it took four years before the Association was officially recognized, which is some indication of the indifferent support it received from the government, and in 1968 Lady Cochrane again criticised the government severely for its lack of interest in the Association's activities.[81]

The yearly budget of the Association averages LL. 100.000 most of which is public subvention.[82]

A few years ago the Ministry of Public Works inaugurated a Department of Urbanism and Regional Planning. In this Department the physical development and particularly the urbanization of the country are studied. At the beginning individual projects were assigned to independent architects and engineers. The absence of clear guidelines resulted in an uneven quality of work and it is not an occasion for regret that most of the projects remained on paper.

For many areas a new building code was formulated which restricts the exploitation of the land, prescribes the use of certain materials and fixes distances from the road and buildings heights. The immediate result of such legislation was stagnation of construction in the restricted zone and a building boom in non-restricted zones.

The only city the architectural character of which is fully protected is Deir el-Qamar. A survey conducted by students of architecture at the American University of Beirut revealed that a large percentage of the houses in Deir el-Qamar were occupied only during the summer, and that the inhabitants in general complained that they were subjected to restrictions but not given the necessary help for improvements.[83]

Indeed, purely restrictive measures cannot lead to adequate results unless they are complemented by positive action, the introduction of new facilities and amenities. To this end continuous and coordinated efforts by national and local agencies are necessary. There is little use for grand plans which are promulgated by foreign experts called in for a limited period of time. The need is for continuity in planning by a qualified staff of local planners, backed by effective legal and executive powers.[84]

Of equal importance, however, is the education of the general public in order to promote the appreciation and understanding of the architectural heritage of Lebanon. In this respect we may quote Michel Chiha, foremost founder of modern Lebanon and editor-owner of the newspaper "Le Jour" at the time. His statement dates back to January 1946 but it has not lost its relevance:[85]

> "In general, the Lebanese do not sufficiently appreciate good and orderly design. They are not particularly interested in well finished and beautiful work. For them the finish is secondary, and too often they are content if a defect is not all too obvious. Still, if serious progress has been achieved during the past few years, the insufficiency in the realms of taste and art remains . . . One way to bring about a renaissance in the Lebanon, would be to make its people learn to have fine buildings and beautiful things. This will take an effort, like everything else. We are asked if there are not more pressing needs? No. This necessity is as important as any other. The formation of taste and the balanced growth of cities are necessary complements to independence. At the moment when construction takes such an important position in Lebanon, and furnishings must be produced in large quantities, it would be inexcusable if we did not intervene forcefully to prevent the nation from being content with the work of men without taste and skill, with ugly and poor products."

Notes

[1] Alfred E. Day, *Geology of Lebanon* (for the whole chapter).
[2] Observatoire de Ksara, *Climat du Liban.*
[3] Victor Olgyay, *Design with Climate,* pp. 22-31.
[4] Philip K. Hitti, *Lebanon in History* (for the whole chapter).
[5] Philip Hitti, *op. cit.,* p. 334.
[6] C.-F. Volney, *Voyage en Syrie et en Egypte,* vol. ii, pp. 66-67.
[7] Harvey Porter, *The History of Beirut,* p. 34.
[8] John Gulick, *Social Structure and Culture Change in a Lebanese Village,* p. 131 ff.
[9] The Arabic term *bayt* means house in general but also room or tent.
[10] F. Ragette, *Architecture without Architects,* ACEM, January 1969, p. 36.
[11] K. Dettmann, *Damaskus,* p. 277.
[12] M. Dunand, *Revue biblique,* October 1950.
[13] M. Dunand, *Fouilles de Byblos,* Vol. I and II.
[14] M. Dunand, "La maison de la sagesse", *Bulletin du Musée de Beyrouth,* Vol. IV.
[15] Wein-Opificius, *7000 Jahre Byblos,* plan D.
[16] J. Gray, *The Canaanites,* p. 56.
[17] John Gulick, *op. cit.,* p. 109.
[18] J. Gulick, *op. cit.,* p. 69.
[19] Reuther, *Das Wohnhaus in Baghdad,* p. 3.
[20] K. Sinjab, *Das Arabische Wohnhaus in Syrien,* p. 9.
[21] O. Reuther, *op. cit.,* p. 42.
[22] K. Swoboda, *Römische und Romanische Paläste,* p. 30.
[23] H.C. Butler, *Architecture and other Arts.*
[24] H.C. Butler, *Ancient Architecture in Syria.*
[25] G. Tchalenko, *Villages antiques de la Syrie du Nord.*
[26] R. Neumann, *Architektur Kleinasiens,* figs. 413 and 417.
[27] Barthelemy, *Dictionnaire arabe-français,* p. 773.
[28] A. Badawy, *Architecture in Ancient Egypt and the Near East,* p. 87.
[29] R. Ghirshman, *Iran,* p. 29.
[30] B. Fletcher, *A History of Architecture,* p. 79.
[31] K. Creswell, *Early Muslim Architecture,* p. 208.
[31] C.G. Feilberg, *La Tente Noire,* fig. 7.
[32] P. Grimal, *Römische Kulturgeschichte,* p. 363.
[33] K. Sinjab, *op. cit.,* p. 9.
[34] G. Dalman, *Arbeit und Sitte in Palästina,* Vol. VII.
[35] J. Gulick, *op. cit.,* p. 109.
[36] H. Zaloscer, "Survivance et migration", *Mélanges islamologiques.*
[37] A. Scattolin, *I Casoni Veneti.*
[38] J. Mauthe, *Venezianische Hausformen des Mittelalters.*
[39] P. Maretto, *L'Edifizia Gotica Veneziana.*
[40] Ferrari-Antoniazzo, *Case Gotico Veneziane in Istria,* p. 23.
[41] Vitruvius, *Ten Books on Architecture,* VI-3.
[42] Pierre Grimal, *op. cit.,* p. 363.
[43] S. Cantacuzino, *European Domestic Architecture,* p. 25.
[44] G. Goodwin, *A History of Ottoman Architecture,* p. 433.

[45] *Ibid.*, p. 441.
[46] *Ibid.*, p. 440.
[47] O. Reuther, *op. cit.*, p. 32.
[48] Franz Pascha, *Kairo,* p. 121.
[49] D. Wilber, *Persian Gardens and Garden Pavilions.*
[50] M.A. Useinow, *Monuments of Azerbeidjan Architecture.*
[51] C. Churchill, *Mount Lebanon,* Vol. I, pp. 72-73.
[52] K. Creswell, *Early Muslim Architecture,* p. 102.
[53] O. Reuther, *op. cit.*, p. 45.
[53] "O (God) who created the world and formed it, protect (this house) for your servant Shaykh Ali who dwells in it" 1295 (A.H., ca. 1877 A.D.).
[54] *Ibid., op. cit.,* fig. 169, 170.
[55] H. Wilde, *Brussa,* p. 120.
[56] R. Riefstahl, *Turkish Architecture in South Western Anatolia,* p. 30.
[57] G. Goodwin, *op. cit.*, p. .
[58] R. Ayoub, "La climatisation naturelle sans installations thermiques", *al-Mouhandess,* 1966.
[59] R. Ruskin, *The Stones of Venice,* Vol. II, p. 223.
[60] Herzfeld, *Archaeologische Reise,* II, pp. 91-92.
[61] H. Butler, *Ancient Architecture in Syria,* B, pp. 26-45.
[62] K. Creswell, *op. cit.*, pp. 102-104.
[63] *Ibid.*, p. 74.
[64] G. Rivoira, *Moslem Architecture,* p. 27.
[65] *Ibid.*, p. 366.
[66] E. Arslan, *Gothic Architecture in Venice,* p. 26.
[67] *Ibid.*, p. 28.
[68] Paolo Carali, *Fakhreddine II e la Corte di Toscana,* p. 126.
[69] D. Magri, *Breve racconto del viaggio al Monte Libano nel 1624.*
[70] G. Mariti, *Istoria de Faccardino.*
[71] P. Hitti, *op. cit.*, p. 417.
[72] Franz Pascha, *Kairo,* p. 151.
[73] O. Reuther, *op. cit.*, p. 27.
[74] W. Gropius, *The New Architecture and the Bauhaus,* p. 37.
[75] Amos Rapoport, *House Form and Culture,* p. 48.
[76] *Règlement sur les antiquités,* Beirut, 1933, article 1.
[77] *Ibid.*, article 24.
[78] *Ibid.*, article 31.
[79] L'Association pour la Protection des Sites et Anciennes Demeures (APSAD), Aoun Bldg., Rue Archevêché Grec-Orthodoxe, Beirut.
[80] Liger-Belair and Kalayan, *L'habitation au Liban.*
[81] Minutes of the APSAD meeting on February 2, 1968.
[82] Report of Treasurer, APSAD 1972.
[83] F. Ragette, "The Beauty of Old Lebanese Architecture and our Obligation to Preserve it", *ACEM,* 69, p. 18.
[84] In this connection it is significant to note that, since spring 1972, the American University of Beirut started a master's degree program in urbanism and planning.
[85] *Patrimoine et Lendemains,* No. 5 (translated from the French).

List of Examples

With Approximate Construction Dates

Glossary of Arabic Terms*

Singular	*Plural* **	*Arabic*	*English translation*
‘ajamī		عجمي	Persian
’āleb	’wāleb	قالب	wooden shuttering
‘āmūd	‘awāmīd/a‘mideh	عامود	pier/pillar
’anṭara	’anāṭir	قنطرة	arch
‘aqd	‘ ’ūd	عقد	vault
’arḍ		ارض	earth
’arḍiyyeh		ارضية	flooring
’asās	’usus	اساس	foundation
‘atbeh	‘tāb	عتبة	step/lintel
‘ayn	‘aynāt	عينة	bay
bāb	bwāb	باب	door
baghdādī		بغدادي	wall partition made of trellised wood and plaster
bayt	byūt	بيت	house
bayt al-mayy	byūt mayy	بيت المي	toilet
bayt ṣayfi	byūt ṣayfiyyeh	بيت صيفي	summer house
bellān		بلان	thorny brush
berdāyeh	berdāyāt	برداية	curtain
bertāsh	brātīsh	برطاش	stone threshold
bīr	abyār	بير	water reservoir
blāṭ ’armīd		بلاط قرميد	red tiling
blāṭ ḥajar		بلاط حجر	flagstone
blāṭ rkhām		بلاط رخام	marble slab
byiftaḥu l-asās		بيفتحو الاساس	breaking ground
dabbeh		دبة	compacted earth
dabsh		دبش	rubble
dahlīz	dhālīz	دهليز	corridor
da‘meh	da‘māt	دعمه	abutment
dār	dūr	دار	central hall
daraj	drāj	درج	stairway
darfeh	diraf	درفة	wood shutter
dīwān	dwāwīn	ديوان	settee placed against a wall
daykūneh	dwākīn	ديكونة	open space used for washing or cooking

* The colloquial pronounciation has been followed for the transliteration.
** Whenever possible, the plural has been mentioned.

Singular	*Plural*	*Arabic*	*English translation*
farsh		فرش	furniture
ghalaq		غاق	keystone
ḥabl knāṭer		حبل قناطر	line of arches
ḥadd	ḥdūd	حد	door jamb
ḥamah kinnah		حماة كنة	conflict with in-laws
ḥammām	ḥammāmāt	حمام	bathroom
ḥāra	ḥarāt	حارة	house
ḥarīm		حريم	women's quarters
ḥāṣel		حاصل	storage
ḥayṭ	ḥīṭān	حيط	wall
ḥayṭ l-barrāneh	ḥiṭān l-barrāniyyeh	حيط البراني	exterior wall
ḥayṭ j-juwwāneh	ḥiṭan j-juwwāniyyeh	حيط الجوانة	interior wall
hilāliyyeh		هلالية	segmental arch
ḥosh		حوش	courtyard
ḥuwwāra		حوارة	lime plaster
isṭabel	isṭablāt	اسطبل	stable
jisr	jsūra	جسر	girder
kallīn		كاين	dry masonry
khamsiyyeh		خمسية	fifth
khzāneh	khzānāt	خزانة	cupboard
kuwwāra	kuwwārāt	كوارة	silo
libn		لبن	mud
līwān		ليوان	living-room
ma''ad	ma'ā'ed	مقعد	seat
madaniyyeh		مدنيّة	shouldered segmental arch
maḍāfa		مضافة	guests' wing
madrasa	madāres	مدرسة	school
madura		مدورة	sunken space behind a door
maḥdaleh	maḥādel	محدلة	stone roller
mā'ideh		مائدة	dining space
ma'laf	ma'ālef	معلف	manger
mandalūn		مندلون	alcove for sitting
maskan	masākin	مسكن	family room
masṭabeh	maṣāṭeb	مصطبة	platform
maṭbakh	maṭābikh	مطبخ	kitchen
matban	mtābin	متبن	fodder storage
maw'ad	mawā'ed	موقد	fire-place
maw'adeh	mawā'ed	موقدة	stove

Singular	*Plural*	*Arabic*	*English translation*
mezrāb	mzārīb	مزراب	waterspout
midmāq	madāmīk	مدماك	horizontal row of stones
mirḥāḍ		مرحاض	oriental toilet
mqarnaṣ		مقرنص	stalactite decoration
mrabba‘		مربع	salon/square
mrāyeh	mrayāt	مراية	mirror
mṣaffaṭ		مصفط	bonded construction
msharrabiyyeh	msharrabiyyāt	مشربية	wooden screen
mu‘allim	m‘allmīn	معلم	master mason
mughrabi		مغربي	horseshoe arch
nab‘	nbū‘a	نبع	well/source
naḥt	nḥīt	نحت	sculpture
nāmūsiyyeh	nāmūsiyyāt	ناموسية	mosquito net
nuṣf rūmīyyeh		نصف رومية	semi-circular arch
qa‘deh	’awā‘ed	قاعدة	pedestal
qaf‘a		قفعة	opening in the roof
qaṣrīne		قصرين	chaff
qauf		قوف	twigs
qifl	’fūleh	قفل	keystone
raqqeh		ركة	core
ra’siyyeh		رأسية	pointed
riwāq		رواق	gallery
rub‘		ربع	quarter
salamlik		سلملك	men’s quarters
saṭḥ	sṭūḥ	سطح	roof
sijjādeh	sijjādāt	سجادة	carpet
sellom	slālīm	سلم	ladder
sham‘a	sham‘āt	شمعة	column
shubbāk	shbābīk	شباك	window
shurfa	shurfāt	شرفة	balcony
sū’	swā’	سوق	aisle
taj	tījān	تاج	capital
takht	tkhūte	تخت	bed
tannūr		تنور	earthen oven for baking bread
ṭāqa	ṭāqāt	طاقة	window/small opening
ṭawleh	ṭawlāt	طاولة	table
ṭīn		طين	mortar
trāb		تراب	earth
trayya	trayyāt	ثرية	chandelier

Singular	*Plural*	*Arabic*	*English translation*
tultiyyeh		تلتية	third
tūt		توت	mulberry
'ūḍa	'uwaḍ	اوضة	room
waṣleh	waṣlāt	وصلة	log
yūk		يوك	large wall niche
zenzlakht		زنزلخت	a kind of poplar
zifr	zfūra	زفر	corbel

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F2 From data by Ksara Observatory
F9, F42 CNT
F46 APSAD
F50 CNT
F51 APSAD
F52 CNT
F54 APSAD
F59, F60, F61 CNT
F66 APSAD
p. 36, p. 38 Dr. Heinz Gaube
F83, F105, F108, F123, F124 APSAD
F129 From Tchalenko, op. cit., pl. V
F130 From Tchalenko, op. cit., pl. XVIII
F131 From Tchalenko, op. cit., pl. VI
F132 From Neumann, op. cit., fig. 413
F133 From Neumann, op. cit., fig. 417
p. 66 Dr. Raif Nassif
p. 68 Dr. Heinz Gaube
F135 CNT
F139, F140, F141 APSAD
p. 90 Dr. Raif Nassif
p. 92 Dr. Heinz Gaube
F167 From Mauthe, op. cit., fig. 1
F169 From Moretti, op. cit.
F170 From Dunand, *Fouilles de Byblos*
F171 From Ferrari-Antoniazzo, op. cit.
F172 After Das Bauernhaus in Österreich-Ungarn, Dresden 1902
F174 After Kalayan, op. cit., p. 38
F176 After Goodwin, op. cit., fig. 128
F179 From Franz Pascha, Cairo, fig. p. 121
F180 From Wilber, op. cit.
F181 From Useinow, op. cit., fig. 99
F182 From Useinow, op. cit., fig. 104
F183 From Useinow, op. cit., fig. 106
F185 After Le Fabbriche piu cospicue de Venezia, Venice 1850
F267 From Reuther, op. cit., fig. 163
p. 164 Dr. Raif Nassif
F275, F277 APSAD
F278 From Wilde, op. cit., fig. 181 and 182
F279 From Wilde, op. cit., fig. 146
F280 From Fiefstahl, op. cit., fig. 44
F281 From Directorate of Geographical Affairs, Lebanon
F282-294 From Ferrari-Antoniazzo, op. cit.
F295 From Ruskin, op. cit., vol. 2, pl. XIV
p. 184 Courtesy Aramco World Magazine
p. 186 Dr. Raif Nassif
p. 194 APSAD, House Assem Salaam, Beirut

Index

NOTE: *The numbers of the figures and examples are printed in bold face. Italicized numbers which immediately follow indicate the pages on which the illustrations appear.*

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